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TWENTY-EIGHTH ANNUAL REPORT

OF THE

BUREAU OF AMERICAN ETHNOLOGY

TO THE

SECRETARY OF THE SMITHSONIAN INSTITUTION

1906–1907

WASHINGTON
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LETTER OF TRANSMITTAL

SMITHSONIAN INSTITUTION,
BUREAU OF AMERICAN ETHNOLOGY,
Washington, D. C., August 17, 1907.

SIR: I have the honor to submit herewith a report of the operations of the Bureau of American Ethnology for the fiscal year ended June 30, 1907.

Permit me to express my appreciation of your aid in the work under my charge.

Very respectfully, yours,

W. H. HOLMES, *Chief.*

DR. CHARLES D. WALCOTT,
Secretary of the Smithsonian Institution.

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REPORT OF THE CHIEF

TWENTY-EIGHTH ANNUAL REPORT

OF THE

BUREAU OF AMERICAN ETHNOLOGY

W. H. Holmes, Chief

SYSTEMATIC RESEARCHES

The operations of the Bureau of American Ethnology, conducted in accordance with the act of Congress making provision for continuing researches relating to the American Indians, under direction of the Smithsonian Institution, have been carried forward in conformity with the plan of operations approved by the Secretary July 19, 1906.

Systematic ethnologic researches have been prosecuted by the scientific staff of the Bureau, assisted by a number of collaborators who have been invited to conduct investigations for which they are especially qualified. The Bureau's scientific staff is restricted to a small number of investigators whose field of labor is necessarily limited, and it has always been the policy of the Bureau to widen its scope by enlisting the aid of specialists in various important branches. While thus seeking to cover in the fullest possible manner the whole field of American ethnology, it has sought with particular care to pursue only such branches of research as are not adequately provided for by other agencies, public or private. The result sought by the Bureau is the completion of a systematic and well-rounded record of the tribes before the ever-accelerating march of change shall have robbed them of their aboriginal characteristics and culture.

During the year researches have been carried on in New Mexico, Arizona, Oklahoma, Louisiana, Mississippi, Florida,

New York, and Ontario. The field work has not been so extensive, however, as during most previous years, for the reason that a number of the ethnologists had to be retained in the office to assist in the completion of the Handbook of American Indians and in the proof reading of reports passing through the press.

The Chief of the Bureau remained on duty in the office during nearly the entire year. Administrative duties occupied much of his time, but during the winter and spring months he was called on to assist in the preparation of the exhibit of the Smithsonian Institution at the Jamestown Exposition, and in April in installing this exhibit. The completion of numerous articles for the Handbook of American Indians, the revision of various manuscripts submitted for publication, and the proof reading of reports and bulletins claimed his attention. Aside from these occupations his duties as honorary curator of the department of prehistoric archeology in the National Museum and as curator of the National Gallery of Art absorbed a portion of his time. The Chief was called on also to assist in formulating the uniform rules and regulations required by the Departments of the Interior, Agriculture, and War in carrying out the provisions of the law for the preservation of antiquities, to pass on various applications for permits to explore among the antiquities of the public domain, and to furnish data needful in the selection of the archeologic sites to be set aside as national monuments. In addition he was able to give some attention to carrying forward the systematic study of aboriginal technology and art, on which he has been engaged for several years, as occasion offered.

At the beginning of the year Mrs. M. C. Stevenson, ethnologist, was in the Indian village of Taos, New Mexico, continuing her studies of the arts, habits, customs, and language of this tribe begun during the previous year. Although the field was new and the traditional conservatism of the tribe made investigation in certain directions difficult or impossible much progress was made, and when the work is completed results of exceptional value will doubtless have been obtained.

In November Mrs. Stevenson visited Santa Clara pueblo with the object of making studies of the people and their culture for comparative purposes, and observations were made of the social customs and religious ceremonies of the people. Afterward several days were spent in Santa Fé, examining the old Spanish records preserved in the archives of the Historical Society of New Mexico, with the view of learning something of the early relations of the local tribes with the Spanish invaders and with their Spanish-speaking neighbors of later times. Late in November Mrs. Stevenson visited the pueblo of Zuñi, the site of her former extended researches, and spent some weeks in completing her studies of certain phases of the native ritual and worship, of religious symbolism as embodied in pictography and ceramic and textile decoration, and in the revision of her list of plants employed for food, medicine, and dyes. Numerous photographs and sketches of ceremonies and ceremonial objects were made. A number of changes were noted in the dramas and other ceremonies since her last visit, and Zuñi, heretofore presenting at night the quiet somberness of an aboriginal village, has now, when dusk falls, the appearance of an eastern town with many lighted windows. Mrs. Stevenson notes that changes are creeping steadily into all the pueblos, Taos perhaps excepted, and is led to express the earnest hope that the work of investigating the town-building tribes of the Southwest be carried forward with all possible energy.

On April 1 Mrs. Stevenson returned to the office, where during the remainder of the year she has been engaged in the preparation of reports on her field researches.

Dr. Cyrus Thomas, ethnologist, has been employed the greater portion of the year in assisting Mr. Hodge on the Handbook of American Indians, not only in the preparation of separate articles, but also in assisting the editor on certain lines of proof reading relating to omissions, uniformity in names, etc. Such time as could be spared from these duties was devoted to the preparation of a Catalogue of Books and Papers relating to the Hawaiian Islands. For this purpose the Library of Congress and other libraries in Washington

were consulted, and a short trip to Worcester and Boston, Massachusetts, was made for the purpose of examining the libraries of those cities, which are the chief depositories in the United States of the early publications of the missionaries in Hawaii. The number of titles so far obtained is about 2,000. Doctor Thomas assisted also with the official correspondence on subjects with which he is particularly familiar, his attainments as a student of ancient Mexican writings having proved of special value in the examination of certain manuscripts in the Cakchikel language submitted by the Librarian of the American Philosophical Society, of Philadelphia.

During the latter part of the previous fiscal year, in pursuance of his linguistic studies, Dr. John R. Swanton, ethnologist, was engaged in preparing an English-Natchez and Natchez-English analytical dictionary, embodying all the published and unpublished material available—that is, about two thousand words and phrases; he also copied on cards all the words and phrases collected by the late Doctor Gatschet from the Attacapa, Chitimacha, and Tunica Indians. At the beginning of the fiscal year Doctor Swanton was engaged in compiling a dictionary of the Tunica language similar to that made for the Natchez. In the field of general ethnology he excerpted and, when necessary, translated, all the available material bearing on the tribes of the lower Mississippi Valley, and arranged for publication that portion dealing with the Natchez.

On April 3 he left Washington to make investigations among the tribal remnants of Louisiana and Oklahoma, and visited the members of the Houma, Chitimacha, Attacapa, Alibamu, Biloxi, Tunica, and Natchez tribes, and was able definitely to establish the relationship of the Houma to the Choctaw and to identify the Ouspie—a small people referred to by the early French writers—with the Ofogoula. From the Tunica and Chitimacha he collected several stories which will be of importance in the endeavor to restore the mythology of the tribes of this area, now almost a blank. In the Cherokee Nation (Oklahoma), contrary to expectation, Doctor Swanton found several persons who still speak the Natchez

language. This discovery will necessarily delay the publication of the Natchez material already referred to, but if prompt measures are taken, will insure the preservation of that language in its completeness. At Eufaula (Creek Nation) he made a slight investigation into the social organization of the Creeks—enough to determine that much work still remains to be done in that tribe entirely apart from language. Doctor Swanton returned to the office June 7, and during the remainder of the year was engaged in arranging and collating the material collected by him.

Dr. J. Walter Fewkes, ethnologist, was employed in the office during the first month of the year reading proofs of his articles on the Aborigines of Porto Rico and Neighboring Islands and on Antiquities of Eastern Mexico, for the Twenty-fifth Annual Report of the Bureau. Part of August and all of September were devoted to the preparation of a bulletin on the Antiquities of the Little Colorado. He spent seven months in Arizona, leaving Washington on October 15 and returning the middle of May. During four months he superintended the work of excavation, repair, and preservation of the Casa Grande Ruin, in Pinal County, Arizona, and in March and April visited a number of little-known and undescribed ruins along Canyon Diablo and Grapevine Canyon, gathering material for his bulletin on The Antiquities of the Little Colorado Valley. During May and June he was employed in the office, devoting his time to the preparation of an account of the excavations at Casa Grande. The explorations at Casa Grande were conducted under a special appropriation disbursed directly by the Smithsonian Institution, and Doctor Fewkes's preliminary report has been submitted to the Secretary. It is anticipated that a final report on the work when completed will be published by the Bureau of American Ethnology.

Mr. J. N. B. Hewitt was occupied during the earlier months of the year in preparing and correcting matter for the Handbook of American Indians, devoting special attention to the articles on the Iroquoian family, Iroquois, Mohawk, Montour, Mythology, Nanabozho, Neutrals, Oneida, Onondaga, and

Ottawa, and to the lists of towns formerly belonging to the Iroquois tribes.

From the 20th of January to the 23d of March, 1907, he was engaged in field work among the Iroquois tribes in New York and in Ontario, Canada. The entire period was devoted to collecting texts in the Onondaga and Mohawk dialects, embodying the basic principles and the civil and political structure and organization of the League of the Iroquois and data relating thereto. The Onondaga texts aggregate about 27,000 words and the Mohawk texts about 1,500 words, making a total of 28,500 words. The following captions will indicate sufficiently the subject-matter of these texts: The Constitution of the League, the Powers of the T'hadoda'ho', Amendments, Powers and Rights of the Chiefs, Powers and Rights of the Women, Powers of the Women Chiefs, Procedure on Failure in Succession, Powers and Restrictions of "Pine Tree" Chiefs, Procedure in Case of Murder, Address of Condolence for Death in a Chief's Family, Forest-edge Chanted Address of Welcome, The Chant for the Dead, Interpretation of the Fundamental Terms, Peace, Power, and Justice.

Mr. Hewitt also continued his duties as custodian of the collection of linguistic manuscripts of the Bureau, the completion of the catalogue of which was entrusted to Mr. J. B. Clayton, head clerk. He has also been called on to furnish data for the correspondence of the office, more particularly that portion relating to the Iroquoian tribes.

Mr. F. W. Hodge, ethnologist, has been engaged during the entire year on the Handbook of American Indians, the editorial work of which has proved extremely arduous and difficult. This work is in two parts: Part I, A—M, was issued from the press in March last, and the main body of Part II was in type at the close of the fiscal year, though progress in proof reading was exceedingly slow on account of the great diversity of the topics treated and the difficulty of bringing up to date numbers of articles, many of them relating to obscure tribes and subjects.

During the entire fiscal year Mr. James Mooney, ethnologist, remained in the office, occupied chiefly on the

Handbook of American Indians and in the classification of the large body of material previously obtained relating to the tribes of the Great Plains. His extended article on Indian Missions, written for the Handbook, has been made the subject of a special reprint, a small edition of which was issued by the Bureau. Mr. Mooney has also given valuable assistance in connection with the correspondence of the Bureau, more especially that portion relating to the languages of the Algonquian stock.

SPECIAL RESEARCHES

For a number of years Dr. Franz Boas, assisted by a corps of philologists, has been engaged in the preparation of a work on the American languages, to be published as a bulletin of the Bureau, entitled "Handbook of American Indian Languages," and it is expected that the manuscript of the first part will be submitted for publication at an early date. Of Part 1, sections relating to the languages of the Eskimo and the Iroquois alone remain incomplete. During the summer of 1906 Mr. Edward Sapir was engaged in collecting data for the handbook, on the language of the Takelma, residing at the Siletz Agency, Oregon, and toward the close of the year Mr. Leo J. Frachtenberg began similar studies among the Tutelo remnant on the Tuscarora Reservation in Ontario, Canada.

Reports of the discovery of fossil remains of men of extremely primitive type in the vicinity of Omaha, Nebraska, led to the assignment of Dr. Aleš Hrdlička, curator of physical anthropology in the National Museum, to the duty of visiting the University of Nebraska, at Lincoln, where the remains are preserved, and also the site of their exhumation. The examinations were made with the greatest care, and the results are embodied in Bulletin 33 of the Bureau, which was in press at the close of the fiscal year. The conclusion reached by Doctor Hrdlička with respect to the age and character of these remains is that they are not geologically ancient, belonging rather to the mound-building period in the Mississippi Valley, and that, although a number of the

crania are of low type, this was a characteristic appearing among many comparatively recent mound-building tribes.

At the beginning of the fiscal year the Bureau was fortunate enough to enter into arrangements with Prof. Herbert E. Bolton, of the University of Texas, for recording the history of the Texan tribes. During the early historical period the French controlled and came into intimate relations with the northern Caddo, hence the early history of this group is to be found chiefly in French records; but with this exception it is mainly in Spanish documents, scattered and almost wholly unprinted. These facts make the task in every sense a pioneer one.

The Spanish manuscript sources available to Professor Bolton, and upon which, aside from the printed French sources, he has thus far mainly drawn, consist of (1) the Béxar archives, a rich collection of perhaps 300,000 pages of original manuscripts that accumulated at San Antonio during the Spanish occupancy, now in the University of Texas; (2) the Nacogdoches archives, a similar but much smaller collection that accumulated at Nacogdoches and that is now in the State Historical Library; (3) the Lamar papers, a small collection of Spanish manuscripts, now in private hands; (4) mission records preserved at the residence of the Bishop of San Antonio; (5) copies of documents from the Archivo General of Mexico, belonging to the University of Texas and to Professor Bolton; and (6) the various Mexican archives. From these have been extracted a great many notes, but much material yet remains to be examined.

During the year Professor Bolton's efforts have taken three principal directions: (1) He has systematically and fully indexed, on about 10,000 cards, a large amount of the early material, including tribal, institutional, linguistic, historical, and other data on the whole Texas field. (2) From this material as a basis he has written for the Handbook of American Indians many brief articles on tribes and missions, aggregating about 20,000 words. (3) While in the analysis of the materials and the making of the index cards he has covered the whole field, in the final work of construction he

has begun the Caddoan tribes of eastern Texas, with the design of treating them separately. In this work Professor Bolton has made commendable progress. He has already written a detailed description, consisting of about 40,000 words, of the location, social and political organization, economic life, religion, and ceremonial of the Hasínai, commonly designated "Texas," as known and described by the earliest European chronicles, accompanied with a map.

The task of writing a history of the Texas tribes is a great one, and can be performed only by long and painstaking effort, but its successful accomplishment promises an important addition to our knowledge of the native Americans.

PRESERVATION OF ANTIQUITIES

With the object of assisting the departments of the Government having custody of the public domain in the initiation of measures for the preservation of the antiquities of the country, the compilation of a descriptive catalogue of antiquities has been continued, and the preparation of bulletins having the same end in view has also received every possible attention. Bulletin 32, Antiquities of the Jemez Plateau, by Edgar L. Hewett, was published and distributed during the year, and Bulletin 35, Antiquities of the Upper Gila and Salt River Valleys in Arizona and New Mexico, by Dr. Walter Hough, was in page form at the close of the year, while bulletins by Dr. J. Walter Fewkes, on the Antiquities of the Little Colorado Valley, and Edgar L. Hewett, on the Antiquities of the Mesa Verde, Colorado, were in course of preparation.

The sum of $3,000, appropriated by Congress for the excavation, repair, and preservation of Casa Grande Ruin, in Arizona, was disbursed by the Smithsonian Institution, Dr. J. Walter Fewkes, of the Bureau of American Ethnology, having charge of the work. A brief preliminary report on the first year's operations will appear in the Quarterly Issue of the Smithsonian Miscellaneous Collections. A second appropriation of $3,000 is provided for continuing the work during the coming year.

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During the year uniform rules and regulations intended to serve in carrying out the recently enacted law for the preservation of national antiquities were formulated and adopted by the three departments having control of the public domain. Under these, on recommendation of the Secretary of the Smithsonian Institution, permits were issued for conducting explorations on Indian reservations and in national forests in Idaho and Wyoming, by the American Museum of Natural History, New York, and among the ancient ruins on the public lands in Navajo and Apache Counties, Arizona, by the University of California. Arrangements were also made with the Interior Department for carrying on explorations at Casa Grande Ruin, Arizona, by the Smithsonian Institution. Under the same law during the year three important archeologic sites were declared national monuments by the President of the United States. They are as follows: Chaco Canyon, in New Mexico, including several important ruined pueblos; El Morro, New Mexico, commonly known as Inscription Rock; and Montezuma Castle, in Arizona, an important cliff-ruin.

CATALOGUE OF LINGUISTIC MANUSCRIPTS

The archives of the Bureau contain 1,626 manuscripts, mainly linguistic, of which only a partial catalogue had previously been made. In January Mr. J. B. Clayton, head clerk, began the preparation of a card catalogue, which was completed at the close of the year. The manuscripts were jacketed in manila envelopes of uniform size, except where bulk prevented, and were numbered from 1 to 1,626.

The catalogue comprises about 14,000 cards which give, as completely as available data permit, the names of stock, language, dialect, collector, and locality, as well as the date of the manuscript. It was not possible in every instance to supply all the information called for under these heads, but the card has been made as complete in each case as the information permitted. The cards have been arranged in one alphabetical series, the names of the languages not only under these languages in their proper alphabetic place, but

also alphabetically under their stocks. Under the name of each collector his manuscripts are indexed under stocks, languages, and dialects. The data in regard to "place" are defective, and a number of the manuscripts are from unknown sources.

EDITORIAL WORK

Mr. Joseph G. Gurley, who was appointed to the position of editor for a probationary period during the previous year, was permanently appointed on August 16, 1906.

The editorial work of the year may be summarized briefly as follows: The proof reading of the Twenty-fourth Annual Report was completed and the work advanced to publication. At the close of the year the Twenty-fifth Annual was practically finished, with the exception of the presswork, while the Twenty-sixth Report was in page form, so that the work was practically ready for printing. Bulletin 32 was completed and published early in the year, and Bulletin 36 also has been issued. Bulletins 33, 34, and 35 are in type, and the proof reading on Bulletins 33 and 35 has progressed so far that they can be put on the press at an early day.

For about three months the Bureau has had the efficient services of Mr. Stanley Searles, who was courteously detailed for the purpose from the proof-reading force of the Government Printing Office. The editor has assisted to some extent in the proof reading of the Handbook of American Indians, Bulletin 30, which is in charge of Mr. F. W. Hodge.

PUBLICATIONS

During the year the Twenty-sixth Annual Report and Bulletins 33, 34, 35, and 36 were forwarded to the Public Printer. Bulletins 31 and 32 were published in July. Part I of the Handbook of American Indians (Bulletin 30) appeared in March and the Twenty-fourth Annual Report in May. One thousand copies of the List of Publications of the Bureau (Bulletin 36) and 500 copies of a special article on Indian missions were issued in June. Fifteen hundred copies of the Twenty-fourth Annual Report and the same number of Bulletin 30, Part I, and Bulletin 32 were sent to

regular recipients. About 1,500 copies of Bulletin 30, Part I, and 200 copies of the Twenty-fourth Annual, as well as numerous bulletins and separates, were distributed in response to special requests, presented for the most part by Members of Congress.

The distribution of publications was continued as in former years. The great increase in the number of libraries in the country and the multiplication of demands from the public generally have resulted in the almost immediate exhaustion of the quota of volumes (3,500) allotted to the Bureau. Few copies of any of the reports remain six months after the date of issue.

LIBRARY

The library remains in charge of Miss Ella Leary, who was able to bring the accessioning and cataloguing of books, pamphlets, and periodicals up to date. In all, there have been received and recorded during the year 760 volumes, 1,200 pamphlets, and the current issues of upward of 500 periodicals, while about 500 volumes have been bound at the Government Printing Office. The library now contains 13,657 volumes, 9,800 pamphlets, and several thousand copies of periodicals which relate to anthropology. The purchase of books and periodicals has been restricted to such as relate to anthropology and, more especially, to such as have a direct bearing on the American aborigines.

COLLECTIONS

The collections of the year comprise large series of objects obtained by Dr. J. Walter Fewkes, in his excavations at Casa Grande Ruins, Arizona, conducted under the immediate auspices of the Smithsonian Institution, and by Mrs. M. C. Stevenson in Zuñi and Taos pueblos, New Mexico.

Some of the minor collections are a cache of stone knife blades from the vicinity of Tenleytown, District of Columbia, obtained through the kindness of Mr. C. C. Glover; a series of relics (fragments of pottery) from the temple of Diana at Caldecote, presented by Mr. Robert C. Nightingale; relics

from the shell heaps of Popes Creek, Maryland, presented by Mr. S. H. Morris, of Faulkner, Maryland; and a number of stone implements and unfinished soapstone utensils from the ancient quarries on Connecticut Avenue extended, Washington, District of Columbia, collected by Mr. W. H. Gill.

ILLUSTRATIONS

The division of illustrations was, as heretofore, in charge of Mr. De Lancey Gill, who was assisted by Mr. Henry Walther. One hundred and fifty-nine illustrations were prepared for Bulletins 30, 33, 34, and 35, and a large number of proofs of illustrations for the various volumes were revised. The photographic work included the making of 277 negatives required in the illustration work and 160 portraits of Indians of visiting delegations. Negatives developed for ethnologists returning from the field numbered 96. During the year a total of 11,078 photographic prints was made.

Albert Samuel Gatschet, a distinguished philologist and ethnologist, for many years connected with the Bureau, died at his home in Washington, District of Columbia, March 16, 1907.

W. H. Holmes, *Chief.*

NOTE ON THE ACCOMPANYING PAPERS

The papers included in this volume are not necessarily to be regarded as a part of the scientific results of the Bureau's researches during the period covered by the administrative report, but are incorporated herein for the sake of convenience.

The report by Doctor Fewkes on the celebrated Casa Grande and surrounding ruins in southern Arizona embodies the results of his observations during excavations conducted therein throughout two winter seasons, by means of special appropriations by Congress for that purpose, together with a review of the general knowledge of these ruins from the time they became known to the Spaniards in the seventeenth century. Two papers on the subject of Casa Grande were previously published under the auspices of the Bureau, one, by Mr. Cosmos Mindeleff, in the Thirteenth Annual Report, the other, by the same author, presenting an account of the repair of the main

ruin, in the Fifteenth Annual Report. It was not until the excavations conducted by Doctor Fewkes, however, that an adequate knowledge of the character and importance of the great house clusters was obtained, and this knowledge, together with such historical data as are available, is now embodied in the present volume as a permanent and final record. A preliminary report of Doctor Fewkes' work at Casa Grande during the first season has been published in the *Smithsonian Miscellaneous Collections*.

A second paper by Doctor Fewkes summarizes the results of his investigations of the Antiquities of the Upper Verde River and Walnut Creek Valleys, Arizona. This report is preliminary in character and is supplementary to the memoir by Mr. Cosmos Mindeleff published in the Thirteenth Annual Report of the Bureau on the archeology of the lower valley of the Verde. No excavations have yet been conducted in the region of which Doctor Fewkes treats, yet sufficient evidence has been gathered from a study of the architectural features of the ruins now visible to enable a determination of the western limits of Pueblo culture in central Arizona and to define the area in which a distinct culture has its beginning.

The memoir by Dr. Truman Michelson, being a Preliminary Report on the Linguistic Classification of Algonquian Tribes, with a map, is based on the author's studies for the Bureau during the years 1910–1912. The Algonquian tribes are now found to be divided linguistically into four major groups, Blackfoot, Cheyenne, Arapaho, and Eastern-Central. The results of Doctor Michelson's observations elucidate many questions formerly existing with respect to the interrelations of the various Algonquian languages and dialects. The map illustrating the memoir was prepared with the cooperation of Dr. John R. Swanton.

F. W. Hodge,
Ethnologist-in-charge.

April, 1912.

ACCOMPANYING PAPERS

CASA GRANDE, ARIZONA

BY

JESSE WALTER FEWKES

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CASA GRANDE, ARIZONA

By Jesse Walter Fewkes

INTRODUCTION

The ruin known by the Spanish name Casa Grande, "Great House," is situated near the left bank of the Gila River about 12 miles from the site of the present town of Florence, Ariz. Immediately after the discovery of Casa Grande by Father Kino, in 1694, there arose a legend, which became persistent, that it was one of the halting places of the Aztec on their way south, or that it was connected in some way with the southern migrations of Mexican tribes. We find it designated also, in early, and even in later writings, Casa Montezuma, or the House of Montezuma, a name that in late years has passed practically out of use, the ruin being now universally known, among both Americans and Mexicans, as Casa Grande, the name given it by Father Kino. The Pima Indians, who dwell in the neighborhood, claim Casa Grande as the habitation of one of their ancient chiefs, and designate it by several names, among which are Vâaki, Old House; Cívanavâaki, Old House of the Chief; and Sialim Cívanavâaki, Old House of Chief Morning Green.

Casa Grande was a ruin when discovered and has not been permanently inhabited since it was first seen by a white man. The identity of its builders has furnished a constant theme for speculation from the discovery of the ruin to the present time. Although it has been ascribed to the Aztec, there is no evidence that the ancient people who inhabited this building were closely related to any tribes of the Mexican plateau, whose culture, as indicated by archeologic remains, was different from that of the Pueblos, or sedentary tribes of New Mexico and Arizona. The age of Casa Grande and contiguous remains is unknown, but there is good reason to believe that settlements on their site were older than most of the present pueblos or cliff-dwellings. The Pima claim, however, that it is not so old as ruins of the same general character situated near Phoenix, on Salt River, a short distance from its junction with the Gila.

Some of the Pima formerly had a superstitious fear of Casa Grande which at times led them to avoid it,[1] especially at night, and many do not now willingly sleep or camp near this remarkable monument of antiquity—a feeling that has given rise to stories that Casa Grande is haunted. It is believed by some Indians that at times flames issue from the ruin; several Pima women were seen to cross themselves when passing near it.

Although Casa Grande is situated a considerable distance from the nearest railroad station, it can be conveniently reached by carriage either from the town of Florence, or from Casa Grande station on the Southern Pacific Railroad. The route to the ruin via Florence is slightly shorter than that from Casa Grande station, enabling one to make the visit and return in a single day. There are a hotel and livery stables in both towns, but the visitor should provide for his own refreshment at the ruin, where there is a good well with abundant water.[2]

After leaving Florence the road to Casa Grande follows the left bank of the Gila westward, crossing a level stretch and skirting for a few miles the base of a low gravelly mesa. The first aboriginal object of interest met with is a group of Indian huts situated on the left of this road. This settlement is of recent origin; the rectangular houses composing it are built in the old style and inhabited by Papago. Near it looms a low white mound indicating an ancient ruin, which will well repay a brief visit. Following the road farther westward, the traveler passes through a cluster of houses known as Adamsville (pl. 1), formerly called Sanford's Mill, an old Mexican settlement; this consists of a double row of rambling roofless houses built of adobe. Although Adamsville is one of the "dead" towns of Arizona and for the most part is deserted, a Mexican family still lives in a fairly well preserved room at the west end of the village. The walls of an old gristmill are still pointed out and those of the former hotel can still be traced. This settlement was once an important station [3] on the stage-coach route between Tucson and Phoenix, and many stories are current regarding the stirring events which took place in these now tenantless rooms when Apache roamed unrestricted the plains of Arizona.[4] The foundations of the adobe walls have been much

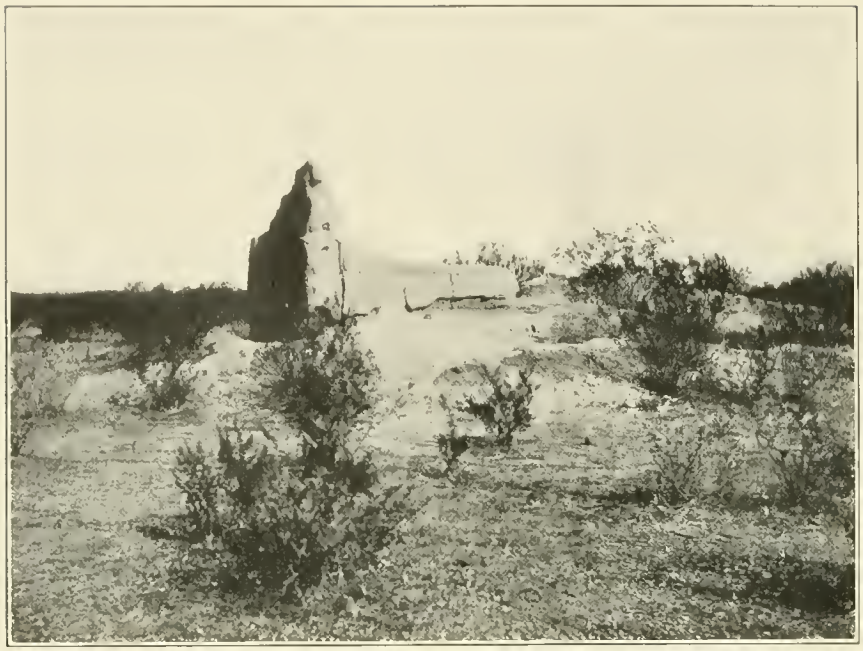
[1] This is not true of most of the Pima. While engaged in relating to the writer the accompanying legends of Casa Grande, Thin Leather slept for several weeks in the west room of the ruin. The hooting of the owls which nest in the upper walls may add to the Pimas' dread of it, but did not seem to disturb him. Several rattlesnakes have been killed in this room, the record of the area covered by the mounds being 20 for the year the writer was engaged in work on Compound A.

[2] The resident custodian, Mr. Frank Pinckley, has built his house in Compound A, and has likewise dug a well, no water having been available when he took up his residence at the ruin. On account of the extreme heat in midsummer, the autumn, winter, or spring months are the best seasons of the year in which to visit the ruins at Casa Grande.

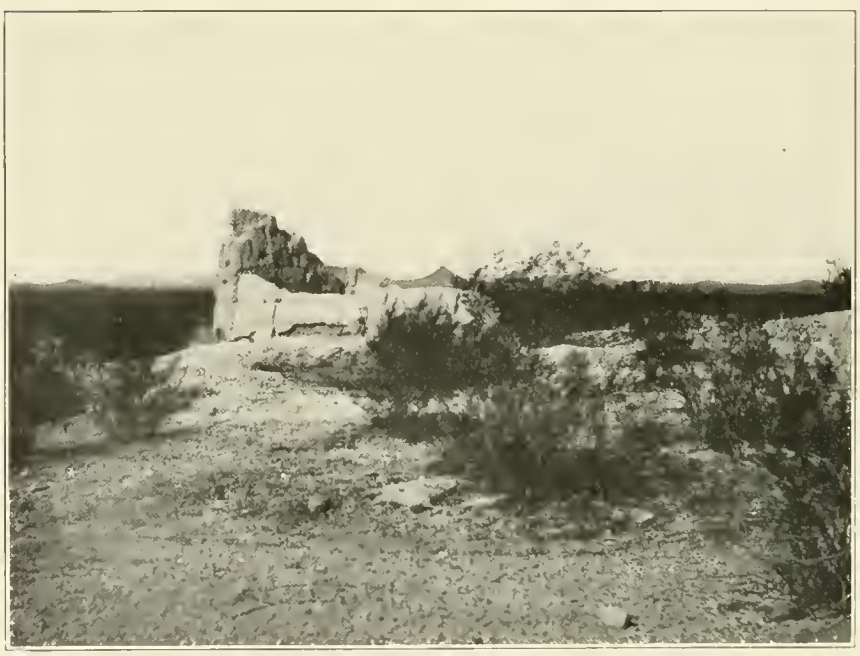
[3] Several persons in Florence, known to the writer, who were born in Adamsville, remember when it was a flourishing town.

[4] If the walls of this place could speak they could recount many bloodcurdling tales of early Arizona history. The son of the Pima chief, Antonio Azul, is said to have been killed in this village.

ADAMSVILLE (SANFORD'S MILL)



FROM THE SOUTHWEST



FROM THE SOUTHEAST

TCURIKVÁAKI

SECTION OF WALL OF RUIN BETWEEN CASA GRANDE AND TCURIKVÅAKI

weakened by rains and in a few years the buildings now standing will fall to the ground.

Somewhat off the main road to Casa Grande, about half a mile south of Adamsville, on a plateau or mesa, rises a cluster of mounds[1] indicating the site of a settlement called by the Pima Tcurikvâaki (*tcurik*, "bisnaga cactus"; *vâaki*, "old house"), which is well worth visiting. This ruin (pl. 2) is approached from the Casa Grande highway by a rarely traveled road, not much more than a wagon track, branching from the main thoroughfare a short distance west of the town. The standing walls of a house[2] that rise considerably above the surface of one of the mounds resemble in structure and general appearance those of Casa Grande. Among the mounds in this cluster is one oval in shape with a central depression indicating a former tank or reservoir. Near by, the surrounding wall of a large compound, including a high mound, suggests that Tcurikvâaki was formerly a place of considerable importance. From this ruin there is a road to Casa Grande which passes a large, conspicuous mound, the site of another ancient Indian settlement. This mound (pl. 3) is instructive because it shows sections of a wall formerly inclosing a rectangular area, suggesting the surrounding wall at Casa Grande.

If the visitor follows the direct route from Adamsville to Casa Grande without making a detour to the Indian mounds above mentioned, he can discern the roof, of corrugated iron, painted red, for some distance before he arrives at his destination. On each side of the road the traveler passes several small mounds belonging to the Casa Grande Group, which are situated not far from the large pyramidal elevations marking Compound B.

The high range on the north side of the Gila in full sight of the traveler the whole way from Florence to Casa Grande is called Superstition Mountains. This range separates part of the Gila Valley from the valley of the Salt River; it is a very wild and broken area, ending precipitously on the south and the west. Concerning this region many Pima legends are extant, the best known of which recounts how a flood once covered the whole earth.[3] To this place an antediluvian chief, named White Feather, followed by his band, once retreated, climbing to the top of these mountains for safety. The water is said to have risen in the valley to a level half-way up the mountain side,

[1] The ruins in the Gila-Salt Valley resembling Casa Grande are considered in another report, Prehistoric Ruins of the Gila Valley (in *Smithsonian Miscellaneous Collections*, No. 1873).

[2] The writer has been informed that Dr. Carlos Montezuma was sold in this house by a Pima Indian.

[3] This is supposed to be the flood the legend of which is still related by old men of the Patki clans of Walpi, who say it was the cause of their leaving Palatkwabi, the mythic southern home of this people. The Pima have a legend of a place in southern Arizona out of which at one time water gushed and covered the whole earth. Here they made offerings, which are continued even to the present day. They call the place by a name meaning "where women cry," for a child was once sacrificed there to cause the waters to subside.

where there is now a stratum of white rock[1] which is clearly visible from Casa Grande. White Feather is said to have taken his stand on top of one of the pinnacles, whence he addressed his followers, reminding them that he had exhausted his magic power in vain efforts to stay the flood. But one supreme resource to control the rising water still remained. As he spoke, he held aloft in the palm of one hand a medicine-stone, invoking the aid of the Sky god, who in reply sent a bolt of lightning that shattered the stone. But as the chief turned to his followers they were found to be petrified where they stood, and there they still stand as rocky pinnacles.[2]

There are many Indian shrines in Superstition Mountains, and as the wind whistles through the deep recesses the Indian fancies he can hear the moans of the shades of the dead who inhabit those dreary canyons.

Another less conspicuous hill, called Walker's Butte, on the north side of the Gila not far from the river bank, is constantly in sight for a long distance from the road from Florence to Casa Grande. Near its base ruined housewalls were discovered, and other remains of aboriginal life, as pictographs, can be found on lava rocks in the neighborhood.

The traveler along this road catches glimpses also of the lofty Santa Catalina Mountains far to the southeast, while to the south rises the distant Casa Grande Range. A solitary peak called Pichacho Mountain is a spur of a range of the same name that lies to the southeast, marking the position of a pass through which the early travelers entered this region from Mexico. Near this peak was situated in old times a Pima settlement called Akutchin ("mouth of the creek"), inhabited from early Spanish times down to a comparatively late date. The mountain itself, known as Tcacca by the Pima, is also associated with Pima legends of the country.[3] The area about the ruin of Casa Grande is broken by but few elevations.

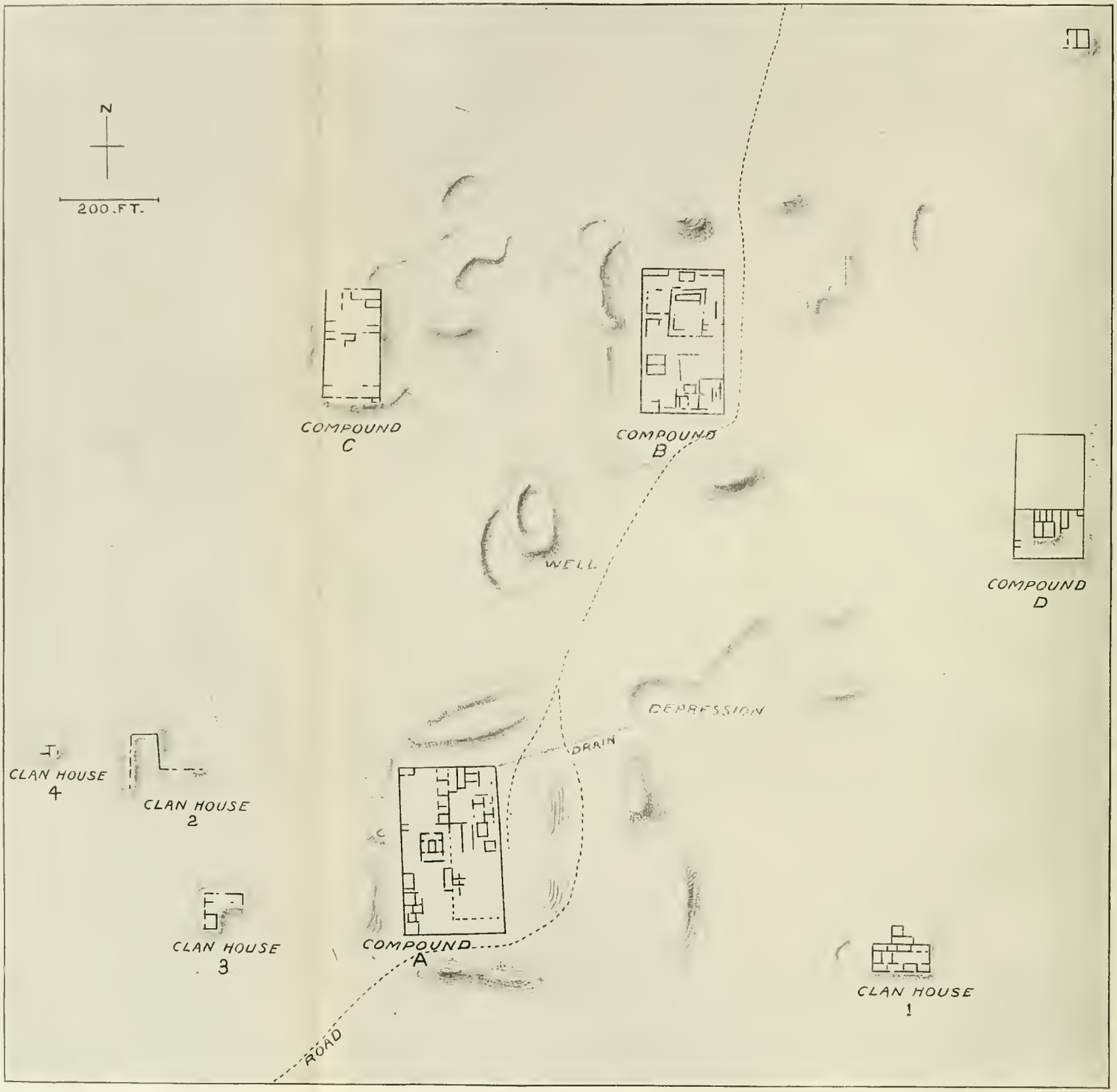
The vegetation in the vicinity of Casa Grande consists mainly of desert growth—mesquite trees, sagebrush, and giant cacti. After the spring rains begin many herbs appear, some bearing small flowers which carpet the earth with variegated colors. Long before one comes to the largest mounds (pl. 4) at Casa Grande, fragments of pottery and other indisputable evidences of former human occupancy may be detected on the surface of the ground. At a Mexican adobe house a few miles from the ruins, near the Gila River, can be traced a long ditch, filled in here and there, marking the site of the prehistoric

[1] A feature of the huge butte here rising to the right of the road to Roosevelt Dam, resembling in form an eagle, by which name it is known to the Pima.

[2] These pinnacles are in plain sight from the road from Mesa to Roosevelt Dam. They are results of erosion, the work of which on a vast scale is visible in many places on the slopes of the Superstition Mountains.

[3] There are still a few Pima and Papago huts in the neighborhood.

BIRD'S-EYE VIEW OF CASA GRANDE GROUP OF RUINS, LOOKING NORTHWEST



GENERAL VIEW OF CASA GRANDE GROUP OF RUINS

irrigation canal, resembling a modern ditch in approximately the same place.

There is no considerable outcrop of rock in the immediate vicinity of Casa Grande and the neighboring plain is almost wholly devoid of stones large enough to use in the construction of walls; nevertheless, several rooms have stones of considerable size built into the foundations of their walls.[1]

WORK OF EXCAVATION AND REPAIR

The excavation of the mounds of Casa Grande was conducted by the Smithsonian Institution by means of appropriations made by Congress for the purpose, the work extending through two winters (1906–07 and 1907–08). The first season's field work was limited to what is here designated Compound A; the second to Compound B and Clan-house 1, together with considerable work on Compounds C and D.[2] (Pl. 5.)

First Season

COMPOUND A

In the first season the excavations were begun at the base of the two fragments of walls rising from the ground at the southwest angle of Compound A. At the beginning of the work the writer was wholly ignorant of the existence of a wall surrounding the area now called Compound A, the object of opening the mound at the base of the outside fragment being to repair the base with cement to prevent its falling. With the exception of several low mounds, more or less scattered, the area about the historic building, Casa Grande, was

[1] Certain implements from Casa Grande, as hatchets and axes, were apparently made from stones collected in the river bed or washed into view along the arroyos.

[2] The manual work of excavation and repair was performed by Pima Indians together with several white men who voluntarily assisted, among whom should be mentioned the custodian, Mr. Frank Pinckley, and Messrs. Hugh Hartshorne, Thomas Ackerman, the late Thomas Ray, and others.

Road building, cutting away underbrush, grading, and incidental work, necessary to open the ruin to visitors, consumed some time during both seasons.

In order to aid those who wish to know when early discoverers visited Casa Grande, and to enable them to follow descriptions where the designations Compounds A, B, C, etc., are used in this report, signboards bearing that information were erected at convenient places. Wooden steps were also placed wherever they could facilitate mounting to the tops of the pyramids.

The Pima workmen above mentioned were natives of the neighboring town of Blackwater, a collection of modern houses, settled by colonists from Casa Blanca. At the time of the discovery of Casa Grande and for several years thereafter, there was a Pima settlement called Uturitue ("the corner"), a few miles from Casa Grande, near the Gila. The natives were driven out of this settlement, the site of which is said to have been washed away as the result of a change in the course of the river. The writer has heard an old Pima call Casa Grande Uturitue, owing to a confusion of localities.

San Juan Capistrano de Uturitue is thus referred to by Father Pedro Font (1775): "This town consists of small lodges of the kind that the Gileños use . . . They lodged me in a large hut [possibly like the "Capilla" on the San Pedro] which they constructed to that end and in front of it they placed a large cross, pagans though they were . . . In the afternoon I went to the town with Father Garces and the governor. Papago de Cojet, to see the fields. Their *milpas* are inclosed by stakes, cultivated in sections with fine canals or draws, and are excessively clean. They are close by the town on the banks of the river, which is large in the season of the freshets."

level, no sign of the boundary wall of the compound projecting above the surrounding plain.

On excavating to the base of the western, or outermost, of the two fragments it was discovered that the true foundations are deep below the eroded part and that a thick wall extends north and south from that point. This wall was found to continue to a point 420 feet to the north, where it turns at right angles, forming the northwest corner of the compound, thence running 230 feet in an easterly direction. Thus was brought to light the west wall, the longest wall of any compound in the Casa Grande Group of ruins. It was then a simple task to trace the three remaining walls, those forming the north, south, and east sides of the compound. (Pl. 6.)

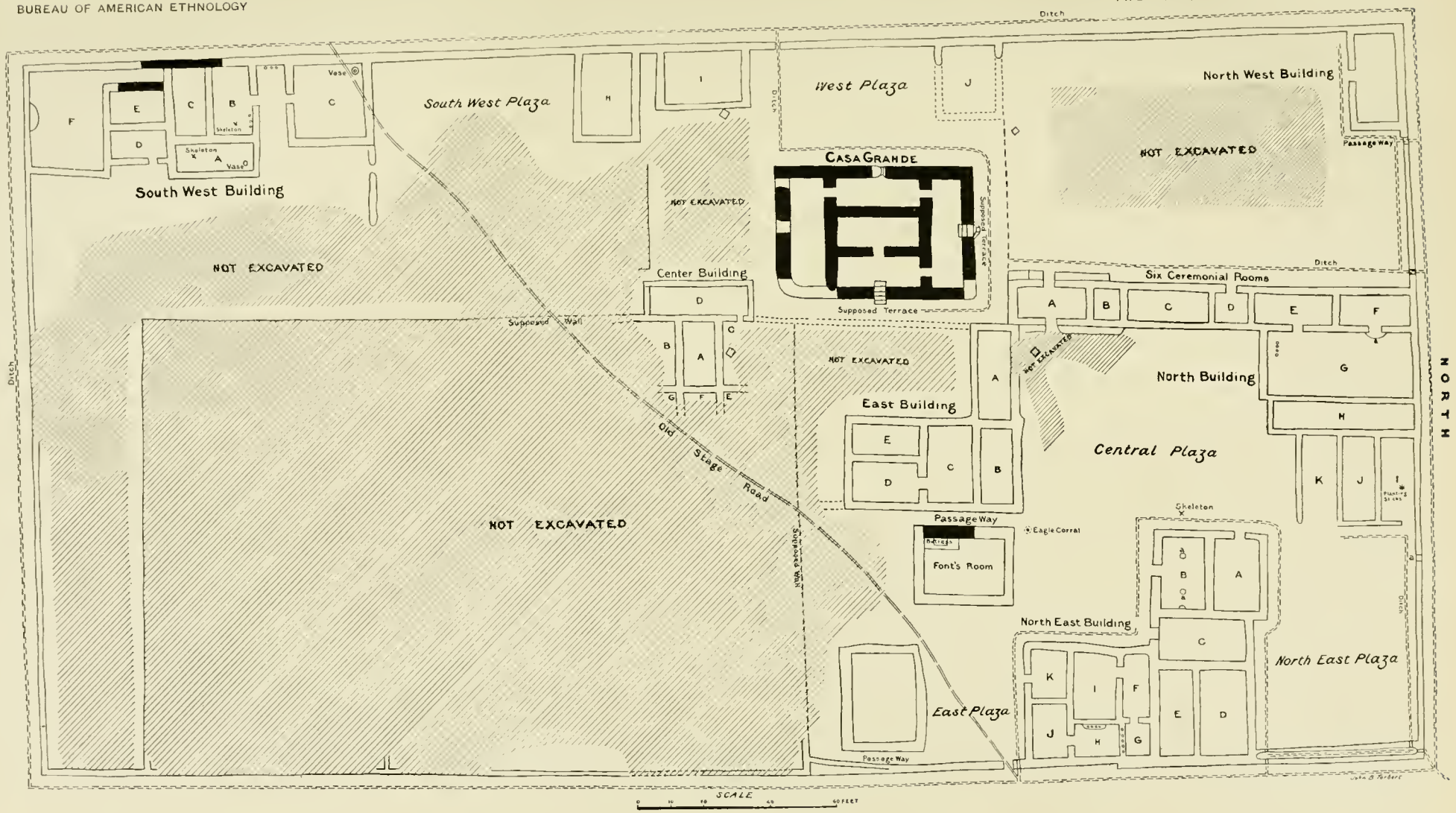
After the surrounding walls of Compound A had been traced throughout their whole length by excavation, a trench being dug along the outside of each to its foundations, it was necessary to remove the earth that had accumulated without and within the inclosure through the years that had passed since Compound A had been abandoned. This was an undertaking of magnitude. When Casa Grande was inhabited the wall of the compound was probably 7 feet high. The upper part (about 3 feet) had fallen level with the ground, about 4 feet above the base, and the débris had filled in along the base throughout the whole length and breadth of the compound.[1] This great accumulation of clayey soil was removed by means of scrapers and transported to the distance of about 50 feet from the compound.

In addition to the removal of the earth that had fallen outside the compound,[2] on the four sides, a drain was dug from the base of each wall along its entire length. This was constructed with sufficient incline to convey water from the wall into a larger ditch extending from the northeast corner to a depression 200 feet away. Similar removals of earth were made and similar ditches constructed on all sides of Compound A; the aggregate length of the drains thus made about this compound is not far from 1,500 feet.

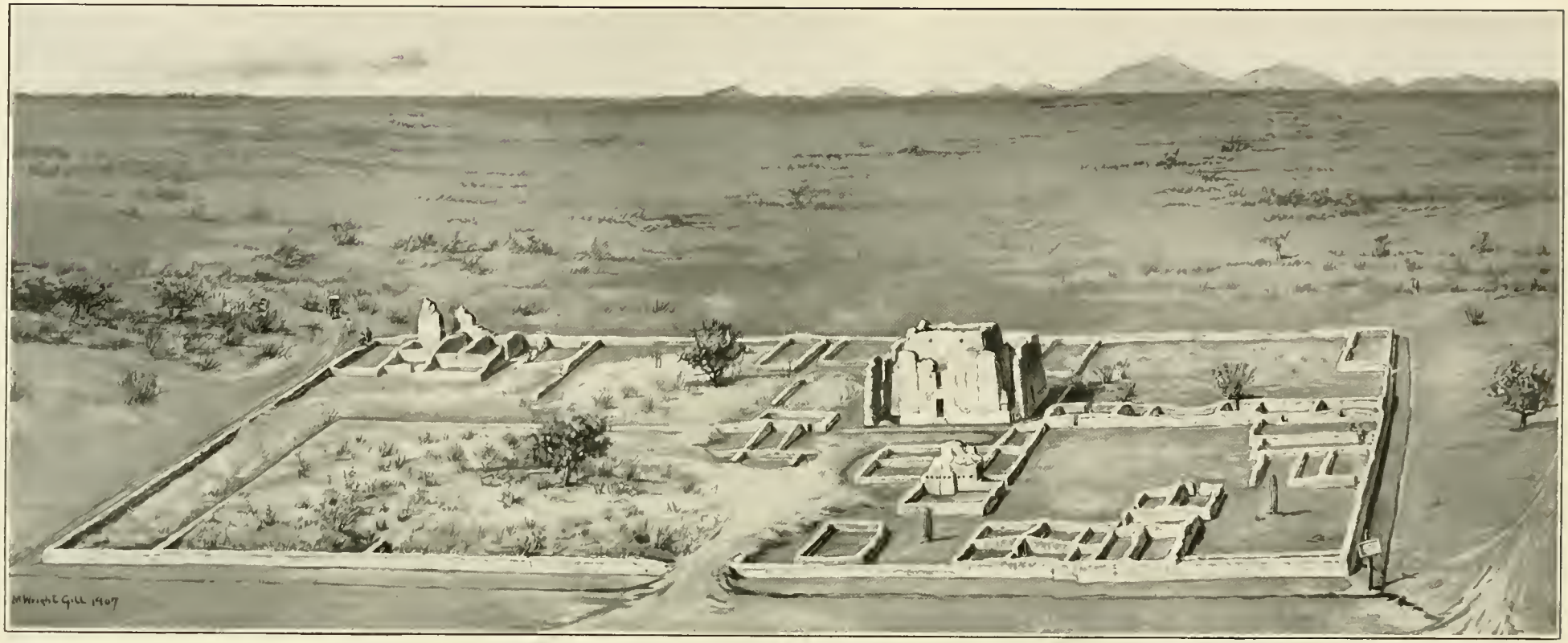
The construction of the main drainage ditch just mentioned was a work of considerable magnitude, as it was necessary, in order to insure the requisite fall, to cut through several elevations or refuse-heaps, that obstructed the course. In addition to the draining ditches above described, a layer of clay coated with a thin layer of cement was placed along the bases of the walls of Compound A to prevent undermining and rapid destruction of their foundations; in some places Mexican adobes were laid on top of the wall to shed water and preserve it from erosion. The foundations of the walls

[1] A preliminary report on the excavations made in 1906–7 was published in *Smithsonian Miscellaneous Collections*, L (No. 1772), 1907.

[2] The accumulation of earth on the east side near the southeast angle was not removed. It is conjectured that this part of the compound was once occupied by small huts, the habitations of the people.



GROUND PLAN OF COMPOUND A



BIRD'S-EYE VIEW OF COMPOUND A, FROM THE EAST

were pierced at intervals to prevent water from accumulating in the compound.

The excavations within the compound were even more extensive than those outside; from this inclosure a larger amount of débris had to be removed to a greater distance than from the area outside the walls.

A block of rooms was excavated in the southwest mound from which rise the two fragments of walls above mentioned. It is instructive to note that the east walls of these rooms are worn down more than the west walls, which are still several feet high, and that the effects of erosion are also more marked on the east side of the historic structure of Casa Grande. The condition may be explained in this way: Originally the east walls were probably not so high as the west walls, a terrace, or platform, being situated on the former side, but the prevailing storms, which come from the east, beating with greater force against the eastern walls, caused them to disintegrate more rapidly.

The now conspicuous row of six ceremonial rooms extending from the northeast corner of the historic building to the north wall of the compound presented the appearance before excavation merely of a low ridge. This ridge, or mound, was a favorite camping place for visitors, especially when the sun was high, the walls of the building making here a pleasant shade. The excavation and removal of the earth from these six rooms and the clearing away of the fallen material from the foundations of the outer walls proved to be a work of considerable magnitude.[2]

The removal of the earth from the plaza in the northwest part of Compound A to the former level of its floor, the excavation of the room in the northwest angle, and the transportation of the accumulations of earth alone necessitated the employment of many workmen for a considerable period. Much time was consumed in clearing out the large cluster of rooms on the northeast side of the compound. When excavation began at this point nothing was visible but a large mound.

The massive-walled building east of Casa Grande, the west wall of which rose several feet above the surface of the mound, was not difficult to excavate, as the earth could be readily removed and the distance to the dump was not great. The southeast section of the compound, which presents no conspicuous elevation, still awaits excavation. (Pl. 7.)

To show the supposed character of the habitations of the ancient people of Compound A, a Pima circular hut (fig. 53) was built near the southwest angle, outside the inclosure.

[1] Some walls which especially needed protection against the elements were capped with adobe bricks to prevent erosion.

[2] The number of cubic yards of earth removed from this vicinity was not accurately determined, but some idea of the aggregate may be given by the statement that 10 scrapers were employed for almost a month in accomplishing this result.

Second Season

The field work carried on in 1907–8 was devoted to Clan-house 1 and to Compounds B, C, and D, beginning with an attempt to determine the position of the surrounding wall of Compound B. The only indication of the existence of this wall was a low "platform," or elevation, mentioned by several authors, rising a few feet above the surface of the plain.

COMPOUND B

The boundary wall of this compound was first encountered at its southeast angle and the first section to be laid bare was the south wall. Having determined the course and length of this wall, the débris was removed from its foundation so that the wall stood clear for an average height of 3 feet. A drain was dug about 5 feet from the base to carry the surplus water into a depression a few hundred feet northwest of the compound.

The determination of the east wall of Compound B was somewhat more difficult than that of the north and west walls because of a reconstruction, or change in direction, possibly by way of repair by the builders, at the southeast corner. The east wall was found to be for the greater part more massive than the south wall and more dilapidated on top than the other walls. The excavation of the north wall followed the completion of the work on the east, the débris about it being removed by means of scrapers. Provision was made for turning all drainage to the northwest corner where the level was somewhat lower than elsewhere; thence the water was conducted into a depression a hundred feet away.

The subterranean room under the northeast wall of Compound B was roofed over to prevent it being filled with water, which in course of time would have destroyed the floor and other evidences of its existence. The wall of the compound, which passes over this subterranean room, was in danger of falling. In order to prevent this a support made of masonry was placed under it, resting on the floor of the underground room.

More earth had to be removed from the base of the west wall of Compound B than from all the others combined, a fact which suggests that formerly this wall was higher than the others but that a considerable portion had fallen or been worn down, burying the foundations. The task of carrying away earth that had fallen from the walls on the outer side and the removal of débris that had washed over it from a neighboring refuse-heap was a considerable one. When this work was finished the wall stood, in the middle, about 10 feet in height.

The excavation of the plazas and rooms adjoining the two great pyramids, or inclosed mounds, of Compound B was not so difficult

as in the case of Compound A, but the removal of the earth was more tedious, it being necessary to carry the material a greater distance. The difficulties of work in Compound B were somewhat increased by the presence of successive floors, one below another. This condition was found on the tops of the mounds and in the plazas, necessitating careful excavation by hand.

The outlines of the many fragile-walled houses supported by rows of posts could readily be followed, but as the supports were much decayed, provision for the preservation of evidence of the existence of these rooms, which otherwise under the torrential summer rains would soon be destroyed, had to be made. To indicate the positions of the upright supports of these walls, new posts of cottonwood were inserted in the old holes, most of which were found to be filled with fine yellow sand and the decayed remains of the former supports. The fireplaces in the middle of the floors of these fragile-walled rooms, opposite the entrances, were protected with wooden covers. The floors were smoothly made and evidently had been tramped down.

The bases of all the walls exposed by the excavation work were strengthened with cement, so that they might resist longer the action of the water.

CLAN-HOUSE 1

The excavation and repair of Clan-house 1 were satisfactorily completed. No walls were visible when work began, but two low ash-colored mounds were traceable among the mesquite trees, indicating the site of a large building; there was no means of knowing, however, the shape or size of the rooms later brought to light. As work progressed on the larger, or more westerly, of these mounds, the west wall of a large building was the first to be traced. Having determined the position of the southwest corner, the removal of earth from the south and west walls was easily accomplished. The earth was hauled some distance from the walls by means of scrapers and later provision was made for diverting the surface drainage on these two sides. The outside of the east and north walls was similarly treated. Temporary roadways left about midway in the west wall were utilized for hauling the material removed from the central room. The plaza east of this room was filled originally with earth to the level of the top of the compound walls; the removal of this to the level of the floors of the central room and plaza required about a month. The bases of the walls were treated with cement and shallow drains parallel with them were dug to carry away the surplus water.

The presence of unusually large accumulations of earth in the rooms of Clan-house 1 can not be accounted for wholly by the falling

of the material eroded from the top of the walls, but was due in part to drifted sand, which for the greater part filled the rooms of the compounds. The sandstorms left deposits at the bases of the walls, both within and without, the sand often drifting like snow; but when the drift was once arrested by the walls and by roots of mesquite trees, and weighted down by the adobe that fell from the walls, the rooms and walls were eventually covered.

COMPOUNDS C AND D

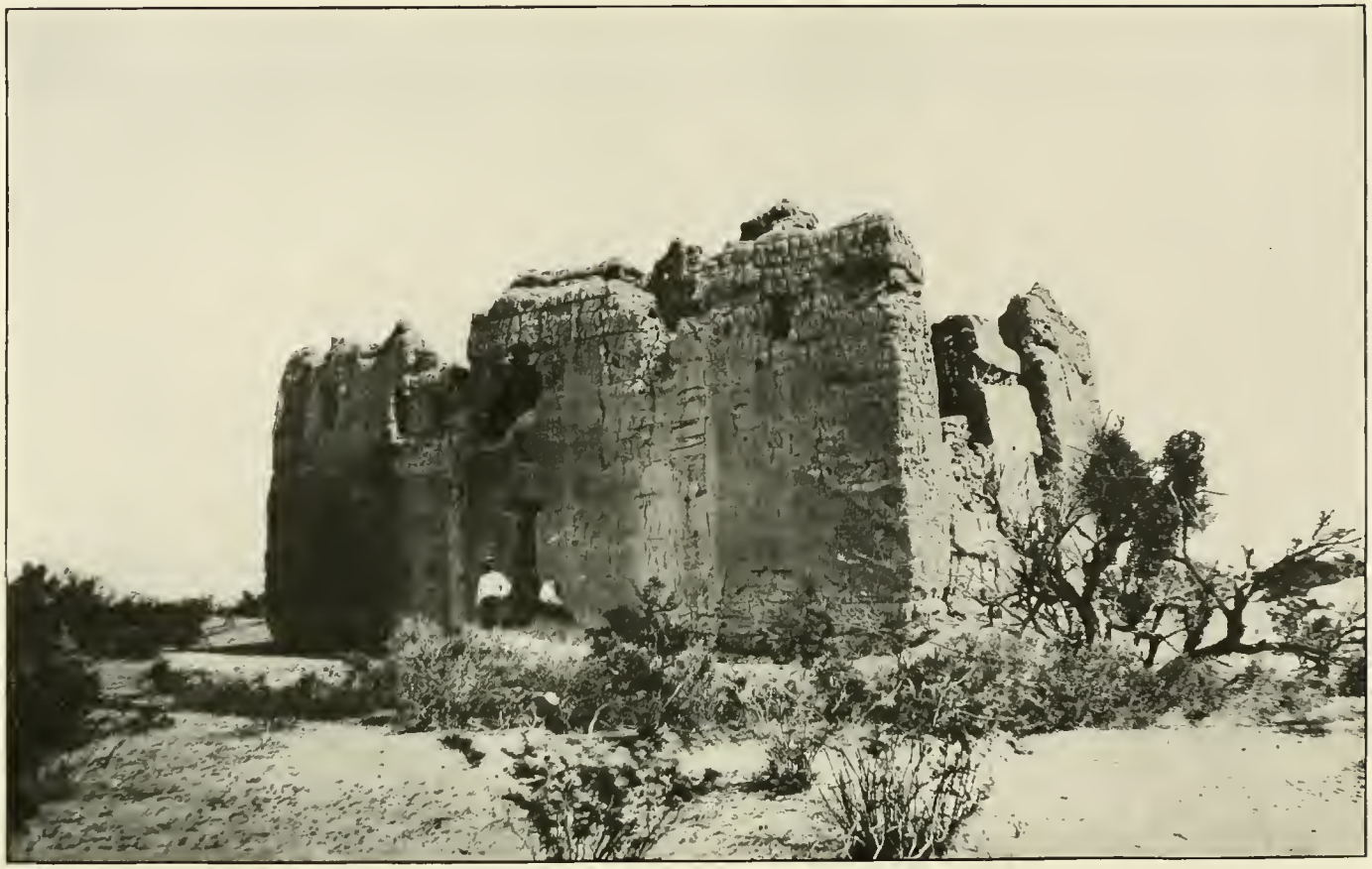
The amount of excavation and repair work on Compounds C and D was not so extensive as on Compounds A and B. Neither of the former contained high mounds, and apparently neither ever had included extensive buildings with thick high walls. The walls of the central building of Compound C were low and few in number. The corners and surrounding walls in Compounds C and D having been determined, part of the accumulated earth was removed, provision being made for protection of the wall where necessary. In both these compounds the surrounding wall had been worn down almost to the level of the plain, a low platform being the only visible evidence of its former existence.

TRADITIONS

The question, Who built Casa Grande? has been repeatedly asked the Pima Indians dwelling in the neighborhood from the time of its discovery in 1694 and their answer has generally come to be, the "Hohokam," or Ancients. But if their old men are interrogated more closely they frequently mention the name of a chief (*civan*) called Morning Green, who, they affirm, constructed the buildings and ruled over the inhabitants. There is internal evidence that the legends they relate of this chief are not inventions of the modern Pima; at all events incidental references to him as master of the Wind gods and the Rain gods date back to Father Font's narrative in 1775. Modern variants of the legends are probably somewhat embellished, however, by repetition from one generation to another.[1] The Pima conception of this chief is best indicated by quoting a few folk-tales, some of which have not been published while others have been known for many years.

[1] Dr. Frank Russell's excellent monograph on The Pima Indians (*26th Ann. Rep. Bur. Amer. Ethnol.*) shows the wealth of Pima (or Maricopa?) material still available. This material, like all legends, can be treated in a scientific way in the interpretation of culture and should not be rejected by archeologists. Ethnology is simply culture-history, of which archeology is one chapter.

Neglect of ethnology in the study of the archeology of the American Indians is unfortunate. Some of the Pima told the writer that his interpreter had made mistakes in interpretations, so that what is given here can be regarded only as approximations to truth. As will appear in many of these legends, the chief of Casa Grande is exalted into a cultus-hero, who had extraordinary magic powers; in some stories he is represented as the supernatural offspring of the sun and a maid.



CASA GRANDE, FROM THE SOUTHWEST

(From Mindeleff)

NORTHEAST CORNER OF CASA GRANDE

There still survive among the Mexicans living in the neighborhood of Casa Grande (pls. 8, 9) a few stories connecting Montezuma with this ruin. One day while the writer was at work on Compound B, an old Mexican who visited the place said that several years ago as he was driving past the ruin from Florence to his farm, which is south of the main building, a man with a long white beard, clad only in a single short garment, stopped him and without a word took his seat on the wagon. When they arrived at Casa Grande the mysterious personage alighted and without speaking entered the ruin; he was never seen again. The Mexican asked whether the writer thought this strange person was Montezuma the old chief.

Font's Legend

This legend (1775) contains the following story (related to Father Font by the governor of Uturituc), which is the oldest legendary account of Casa Grande, or Cívanaváaki,[1] extant, from Pima sources:

He [the governor] said—

That in a very distant time there came to that land a man who, because of his evil disposition and harsh sway, was called The Bitter Man; that this man was old and had a young daughter; that in his company there came another man who was young, who was not his relative nor anything, and that he gave him in marriage his daughter, who was very pretty, the young man being handsome also, and that the said old man had with him as servants the Wind and the Storm-cloud. That the old man began to build that Casa Grande and ordered his son-in-law to fetch beams for the roof of the house. That the young man went far off, and as he had no ax nor anything else with which to cut the trees, he tarried many days, and at the end he came back without bringing any beams. That the old man was very angry and told him he was good for nothing; that he should see how he himself would bring beams. That the old man went very far off to a mountain range where there are many pines and, calling on God to help him, he cut many pines and brought many beams for the roof of the house. That when this Bitter Man came, there were in that land neither trees nor plants, and he brought seeds of all and he reaped very large harvests with his two servants, the Wind and the Storm-cloud, who served him. That by reason of his evil disposition he grew angry with the two servants and turned them away and they went very far off; and as he could no longer harvest any crops through lack of the servants, he ate what he had gathered and came near dying of hunger. That he sent his son-in-law to call the two servants and bring them back and he could not find them, seek as he might. That thereupon the old man went to seek them and, having found them, he brought them once more into his service, and with their aid he had once more large crops, and thus he continued for many years in that land; and after a long time they went away and nothing more was heard of them.

He [the governor] said also, that after the old man there came to that land a man called The Drinker, and he grew angry with the people of that place and he sent much water so that the whole country was covered with water, and he went to a very high mountain range which is seen from there, and which is called The Mountain of the Foam (*Sierra de la Espuma*), and he took with him a little dog and a coyote. (This mountain range [Superstition Mountains] is called "of the foam" because at the end of it, which is cut off and steep like the corner of a bastion, there is seen high

[1] The term *Civanaváaki*, which has been translated "chief of the ancient house," is a general term applied also to other *casas grandes* in the Gila-Salt Valley.

up near the top a white brow as of rock, which also continues along the range for a good distance, and the Indians say that this is the mark of the foam of the water which rose to that height.) That The Drinker went up, and left the dog below that he might notify him when the water came too far, and when the water reached the brow of the foam the dog notified The Drinker, because at that time the animals talked, and the latter carried him up. That after some days The Drinker Man sent the Rose-sucker (*Chuparosas*) to Coyote to bring him mud; they brought some to him and of the mud he made men of different kinds, and some turned out good and others bad. That these men scattered over the land, upstream and downstream; after some time he sent some men of his to see if the other men upstream talked; these went, and returned saying that although they talked, they had not understood what they said, and that The Drinker Man was very angry because these men talked without his having given them leave. That next he sent other men downstream to see those who had gone that way and they returned saying that they had received them well, that they spoke another tongue but that they had understood them. Then The Drinker Man told them that those men downstream were the good men and there were such as far as the Opa, with whom they are friendly, and there were the Apache, who are their enemies. He [the governor] said also that at one time The Drinker Man was angry with the people and killed many and transformed them into saguaros (giant cacti), and on this account there are so many saguaros in that country . . . Furthermore, he said that at another time The Drinker Man was very angry with the men and caused the sun to come down to burn them, and was making an end of them; that he now begged him much not to burn them, and therefore The Drinker Man said that he would no longer burn them and then he told the sun to go up, but not as much as before, and he told them that he left it lower in order to burn them by means of it, if ever they made him angry again, and for this reason it is so hot in that country in summer.

He [the governor] added that he knew other stories; that he could not tell them because the time was up, and he agreed to tell them to us another day; but as we had laughed a little at his tales, which he related with a good deal of seriousness, we could not get him afterward to tell us anything more, saying that he did not know any more.[1]

Legends from Other Sources

In the account of Casa Grande given by Johnston[2] he wrote (1847) as follows:

The general asked a Pimo who made the house [Casa Grande] I had seen. "It is the 'Cara [sic] de Montezuma,'" said he; "it was built by the son of the most beautiful woman who once dwelt in yon mountain; she was fair, and all the handsome men came to court her, but in vain; when they came, they paid tribute, and out of this small store, she fed all people in times of famine, and it did not diminish; at last, as she lay asleep, a drop of rain fell upon her navel, and she became pregnant, and brought forth a boy, who was the builder of all these houses."

Capt. F. E. Grossman[3] in 1871 made the following allusions to the Pima legends regarding Casa Grande:

The Pimas claim to be the direct descendants of the chief Sŏ'-hŏ. The children of Sŏ'-hŏ reinhabited the Gila River Valley, and soon the people became numerous.

[1] It will be seen that there are some parts of this story almost identical with a story that follows, told the writer by Thin Leather in 1907–8.

[2] Johnston, Journal, in Emory, Notes of a Military Reconnoissance, Washington, 1848 (Ex. Doc. 41, 30th Cong., 1st sess., 1848).

[3] *Smithsonian Report* for 1871, p. 408.

One of the direct descendants of Sŏ′-hŏ, King Si′-va-no, erected the Casas Grandes on the Gila River. Here he governed a large empire, before—long before—the Spaniards were known.

The following quotation is taken from Bandelier's report:[1]

Mr. J. D. Walker, an old resident in the vicinity of Casa Grande, who has been to me personally an excellent friend and valuable informant, told me this tale.

The Gila Pimas claim to have been created on the banks of the river. After residing there for some time a great flood came that destroyed the tribe, with the exception of one man, called Ci-ho. He was of small stature, and became the ancestor of the present Pimas. The tribe, beginning to grow in numbers, built the villages now in ruins and also spread to the north bank of the river. But there appeared a monstrous eagle, which, occasionally assuming the shape of an old woman, visited the pueblos and stole women and children, carrying them to his abode in an inaccessible cliff. On one occasion the eagle seized a girl with the intention of making of her his wife. Ci-ho thereupon went to the cliff, but found it impossible to climb. The girl, who was still alive, shouted down to him the way of making the ascent. When the eagle came back, Ci-ho slew him with a sword, and thus liberated his people from the scourge.[2]

The following existing Pima legends relating to Morning Green, chief of Casa Grande, were collected from Thin Leather (Kamaltkak), an old Pima regarded as one of the best informed story-tellers of the tribe.[3] Some of his legends repeat statements identical with those told to Father Font, 137 years ago, a fact which proves apparently that they have been but little changed by intervening generations. The statement which recounts how Morning Green was miraculously conceived by a Hohokam maiden has been verified by several legendists. The following stories supplement published legends of this chief and other ancients and shed light on the condition of early society in the settlement over which Morning Green is said to have ruled.

HOW A CHIEF OF ANOTHER "GREAT HOUSE" ENTICED THE WOMEN FROM CASA GRANDE

Morning Green, chief of Casa Grande, invited Chief Tcernatsing and his women to visit him. Tcernatsing lived in a great house situated near Gila Crossing, which is so far away from Casa Grande that he found it necessary to camp one night en route at the settlement on the Gila River opposite Sacaton. When the visitors arrived at Casa Grande a dance was celebrated in the open space north of Compound A, somewhere between it and the circular wall inclosing a reservoir or "well." Here the women who accompanied Tcernatsing danced with those of Casa Grande, singing the song:

Ta sai na wŭ wŭ
Sun shade sing with me
My body will become a humming-bird

When Tcernatsing came and witnessed the women dancing he shook his rattle and sang a magic song, which enticed all the women of Casa Grande to follow him to

[1] Bandelier, Final Rep., pt. II, in *Papers Arch. Inst. Amer.*, IV, p. 463, 1892.

[2] For another version of this tale, see Bancroft, Native Races, vol. iii, p. 79.

[3] Many other legends were collected, but these have no bearing on Casa Grande, and some of them have been published by previous observers, especially Doctor Russell, who obtained many of his stories from the same authority. It is said that most of these legends are from the Maricopa; several show missionary influence.

another dance place, nearer the Gila. Morning Green, who also sang a magic song, found it powerless [1] to prevent the departure of the women, and he went back to his house for a more powerful "medicine," after which he returned to the dance and ordered his women back to their dwellings; but they were so much bewitched by the songs of Tcernatsing that they could not, or would not, obey him. Farther and farther from their homes Tcernatsing enticed the women, dancing first in one place and then in another until they came to his compound. Among the women who abandoned their home was the wife of Morning Green, who refused to return even after he sent a special messenger to her.

The sequel of the legend is that Tcernatsing married Nactci, a daughter of Morning Green, making her father so angry that he sent a spider to bite his own grandson, offspring of the union. When the boy was sick unto death Tcernatsing invited Morning Green to visit his grandson before the boy died. Morning Green relented and sent his daughter an herb (the name of which is lost) powerful enough to cure the spider's bite, and thus the child's life was spared.[2]

Another legend of Chief Morning Green, also obtained from Thin Leather, affords an instructive glimpse of prehistoric thought.

HOW TURQUOISES WERE OBTAINED FROM CHIEF MORNING GREEN

One day, long ago, the women and girls of Casa Grande were playing an ancient game called *toka*,[3] formerly much in vogue at Casa Grande, but now no longer played by Pima. During the progress of the game a blue-tailed lizard was noticed descending into the earth at a spot where the stones were green.[4] The fact was so strange that it was reported to Morning Green, who immediately ordered excavation to be made. Here they eventually discovered many turquoises, with which they made, among other things, a mosaic covering for a chair that used to stand in one of the rooms of Casa Grande. This chair was carried away many years ago and buried, no one knows where.

Morning Green also distributed so many turquoises among his people that the fame of these precious stones reached the ears of the Sun, in the East, who sent the bird with bright plumage (parrot?) to obtain them. When Parrot approached within a short distance of Casa Grande he was met by one of the daughters of the chief, who returned to the town and announced to her father the arrival of a visitor from the Sun. The father said, "Take this small stick, which is charmed, and when Parrot puts the stick into his mouth, you lead him to me." But Parrot was not charmed by the stick and refused to take it into his mouth and the girl reported her failure. The chief answered, "Perhaps the strange bird would eat pumpkin seed," and told his daughter to offer these to him. She made the attempt without result and, returning,

[1] Evidently Morning Green had met his equal in Tcernatsing, whose "medicine" was superior to that he employed on the first trial of magic power.

[2] Morning Green (Sialim Tcutuk) is regarded by the Pima as an historic personage. *Civan* is here interpreted as a generic name for "chief," not limited to Morning Green alone; all chiefs of the ancients are called *civani*. In commenting on the word *Siba* of Kino and Mange, and on *Cibola*, Doctor Russell puts this query: Is the similarity of this term (*siba*) to Shi'wona or Sbi'wina, given by Mr. F. H. Cushing as the native name of the Zuñi country, a mere coincidence? This question assumes a new significance if we remember that some of the Zuñi clans originally came from villages ruled over by the *Civani*.

[3] The players in this game were generally 10 in number, facing each other about 100 yards apart. Each participant had a pointed stick with which she caught a rope having a knot at each end.

[4] In a legend of the Hopi, turquoises are said to be the excrement of a reptile.

The legend of the "throne" of Montezuma covered with turquoises may be of late introduction, but how the resemblance to the Mexican account is to be accounted for among the Pima does not appear; possibly by the same means as in the case of the name Montezuma. In this connection attention is directed to the "seat" excavated in Clan-house 1 (fig. 19).

reported that the bird refused pumpkin seed. The father then said, "Put the seed into a blanket and spread it before the bird; then perhaps you may capture him." Still Parrot would not eat, and the father thereupon suggested watermelon seeds. But Parrot was not tempted by these nor by seeds of cat's claw, nor was he charmed by charcoal.[1]

The chief of Casa Grande then told his daughter to tempt Parrot with corn well cooked and soaked in water, in a new food-bowl. Parrot was obdurate and would not taste it, but, noticing a turquoise bead of blue-green color, he swallowed it; when the two daughters of the chief saw this they brought to him a number of blue stones, which the bird greedily devoured. Then the girls brought valuable turquoise beads, which Parrot ate; then he flew away. The girls tried to capture him, but without success. He made his way through the air to the home of the Sun in the East, where he drank an emetic and vomited the turquoises, which the Sun god distributed among that people which reside near his house of rising, beyond the eastern mountains. This is the reason, it is said, why these people have many stone ornaments made of this material.

But when the chief of Casa Grande heard that Parrot had been sent to steal his turquoises, he was greatly vexed and caused a violent rain to fall that extinguished all fires in the East. His magic power over the Rain god was so great that he was able even to extinguish the light of the Sun, making it very cold. Then the old priests gathered in council and debated what they should do. Man-Fox was first sent by them into the East to get fire, but he failed to obtain it, and then Road-runner was commissioned to visit Thunder, the only one that possessed fire, and steal his lighted torch. But when Thunder saw him running off with the torch he shot an arrow at the thief and sparks of fire were scattered around, setting afire every tree, bush, and other inflammable object, from which it happens that there is fire in everything.

HOW MORNING GREEN LOST HIS POWER OVER THE WIND GODS AND THE RAIN GODS

Morning Green is reputed to have had special magic power over two supernatural beings, known as Wind-man and Rain-man. It happened at one time that many people were playing a game with canes in the main plaza of Morning Green's settlement [Casa Grande], on the south side of the compound; among these were Rain-man and Wind-man. The latter laid a wager that if he lost, his opponent should look on the charms of a certain maid. When Wind-man lost, in revenge he sent a great wind that blew aside her blanket, at which indignity she cried and complained of Wind-man to Morning Green, who was so angry that he made Rain-man blind, obliging him to be led about by his servant, the wind; he also banished both from Casa Grande. They went to the San Bernardino Mountains in what is now California and lived at Eagle Mountain, near the present town of Wadsworth, where as a consequence it rains continually.

After the banishment of these two the rain ceased at Casa Grande for four years, and Morning Green sent Humming-bird to the mountains where Wind-man and Rain-man resided. Humming-bird carried with him a white feather, which he held aloft to detect the presence of the wind. Three times he thus tried to discover Wind-man by the movement of this feather, but was not successful. When at last Humming-bird came to a place where there was much green grass he again held up the feather to see whether it showed any movement of the air. It responded by indicating a slight wind, and later he came to the spot where Wind-man and Rain-man were, but found them asleep.

[1] Charcoal, the product of fire, is regarded by the Hopi *Yaya*, or fire priests, as possessing most powerful magic in healing diseases, especially those of the skin in which there is a burning sensation.

Humming-bird dropped a little medicine on the breasts of Wind-man and Rain-man, which caused them after a time to move and later to awake. When they had risen from their sleep Humming-bird informed them that Morning Green had sent him to ask them to return and again take up their abode with him at Casa Grande. Rain-man, who had no desire to return, answered, "Why did Morning Green send us away?" and Wind-man said, "Return to Morning Green and tell him to cut off his daughter's hair and make from it a rope.[1] Bring this rope to me and I will tie it about my loins that Rain-man, who is blind, may catch hold of it while I am leading him. But advise all in Casa Grande to take the precaution to repair the roofs of their houses so they will not leak, for when we arrive it will rain violently." Humming-bird delivered the message to the chief of Casa Grande and later brought back the twisted rope of human hair. Wind-man and Rain-man had barely started for Casa Grande when it began to rain, and for four days the downpour was so great that every roof leaked. Morning Green vainly used all his power to stop the rain, but the magic availed but little.

THE BIRTH OF HOK

Long ago the Sun god sent a messenger on an errand to the settlement now called Casa Grande. As this messenger proceeded on his way he occupied himself in kicking a stone ball, and on approaching Casa Grande he gave the ball so violent a kick that it landed near a maiden who sat on the housetop making pottery. Seeing the object, the girl picked it up and hid it under her belt. When the man sought the stone it was nowhere to be found; he asked the girl if she knew where it fell, but she would not divulge what had become of it. Discouraged in his quest, the man was about to return to the Sun god, but the girl urged him not to depart but to search more diligently for the ball. She also sought for it, but it was no longer under her belt; it had disappeared. Later she was with child and in due time gave birth to a girl baby, which, instead of feet and hands, had claws like a bear or a mountain lion. As this strange child grew older and played with other boys and girls she scratched them so often with her claws that they were afraid of her, and ran away whenever she appeared. The brothers of the girl were hunters of rabbits, but were unsuccessful. When their sister grew older she followed them to the hunt and their luck changed, so that thenceforth they killed plenty of game. As she matured, however, she outgrew all restraint and became a wild woman. She was then called Hok, and developed into a cannibal monster, who captured her victims wherever she went and carried them in a basket on her back until she wished to devour them.[2] Hok once met two youths, whom she tried to capture, but they ran swiftly away and when she made another attempt they blinded her by throwing sand in her eyes. This monster terrorized the whole country to such an extent that the ancients sought her life, but in vain. The culture-hero, Tcuhu, endeavored to kill Hok. He turned himself into a snake and furnished the children with rattles; when Hok approached them they shook these rattles and frightened her. Hok first retired to a distant cave in the Santa Catalina Mountains, but later went south to Poso Verde. The people living there were also oppressed by Hok and desired to kill her. Tcuhu[3] sent word to his uncle that there was to be a dance at Casa Grande and asked him to invite Hok to attend. This was a kind of ceremonial dance in which men and women participate, forming a circle and alternating with each other. Several invitations were sent to Hok, but she did not accept; at last she promised to attend the dance and to be there at sunset. Tcuhu danced and smoked with Hok, and the festivities lasted four days and nights. While she was absent the

[1] Ropes were made of human hair up to within a few years by the Pima, who used them on burden-baskets (*kihus*) and for other purposes.

[2] The Hopi have a similar bogy, who is personated annually at Walpi in February, at which time she threatens to kill all children. She carries a knife in her hands, and has a basket on her back for the heads of the victims she declares she will decapitate.

[3] The name Tcuhu is sometimes interchanged with Montezuma as if the two personages were identical.

women gathered wood and made a fire in the cave where Hok lived. When she discovered what had taken place she flew to the top of her cave and entered it through a crack open to the sky. At the opening Tcuhu stood so as to prevent Hok's escape and slew her as she emerged.

A CREATION LEGEND

In the beginning all was dark and there was neither earth nor sky. Earth Doctor (Tcuwut Marka) was the only being then living.[1]

Earth Doctor tôok a particle of sweat from his body and made from it a small disk, which he held in his hand and started to go to the west. When he stopped, the sweat showed signs of life, for it trembled; he proceeded and still the material moved. He halted four times in his course and as he stopped the fourth time the disk, which was the nucleus of the earth, became stable, and neither trembled nor wavered.[2] He then knew he was at the middle point of the universe. Earth Doctor then made a bush and created small ants to feed on it. He took a louse from his breast and put it at the root of the bush. This insect found a ring of soil that kept growing larger and larger as Earth Doctor danced near it, until it became the earth. In the same way the solid sky was formed. Earth Doctor pounded "medicine" in a bowl and shortly afterward there appeared over the surface a transparent substance resembling ice. Earth Doctor threw this substance toward the north, where it fell but shortly afterward rose again and then sank below the horizon. He then cast another fragment to the west and it fell below the horizon, never to rise again. He threw another fragment into the south; this struck the earth or sky and bounded back, whereupon he picked it up and again threw it to the south. This time it rose and passed over the sky. These fragments became the sun and the moon, both formed in the same way. Earth Doctor spurted a mouthful of medicine-water into the sky and created the stars, first the larger and then the smaller, the last of all being nebulæ like the Milky Way. Having formed the celestial bodies, he made seeds of all food used by man, after which he created men and women from a particle of sweat or grease from his body.

Buzzard Doctor lives in the Underworld, where there are many people similar to those who inhabit the earth. The entrance [*sipapu*] to this underworld is in the east.

As soon as men and women had been created they began to quarrel; this angered Earth Doctor and he put them to death. After he had killed all human beings, Earth Doctor and Buzzard emerged together from the Underworld and the former begged the latter to help him re-create men and women. The result was men who were gray-haired at birth. Earth Doctor again destroyed man because he smoked too much, but on the fourth trial there emerged from the earth four men who later became great medicine-men—Land, Buzzard, Tcuhu, and Tohouse.[3]

The youth Tcuhu became a great warrior and married many women, whom he deserted before children were born.[4]

A FLOOD LEGEND

The Pima believed that the flood was caused by Earth Doctor, who stuck his staff [5] into the ground, making a hole out of which water issued, covering the earth. Tcuwut, Tcuhu, and Tohouse crawled into ollas and floated away. When the earth was

[1] This legend differs from other purely aboriginal creation legends with which the author is acquainted, in accounting for the origin of earth and sky.

[2] See Zuñi legend of the search for the "middle," or stable, point on the earth (in *13th Ann. Rep. Bur. Ethnol.*, p. 373).

[3] Because the men were thus destroyed four times some people think there are four worlds.

[4] The son of Tcuwut went to get his child, but when he took it in his arms he became a snipe and the baby became what the Pima call a water baby.

[5] Several Hopi and Hano legends recount that when the *tiponi*, or emblematic palladium, was placed on the earth a spring was developed.

covered with water, Humming-bird, led by Buzzard, flew into the sky, crying out that they would return after the water should have subsided. Buzzard soared aloft to an opening in the sky, through which he passed, but his companion could not follow him. Both were caught in the passage and there they hung. Humming-bird cried because it was cold in the sky region, but Woodpecker made a nest of feathers to keep them warm. The flood rose until the water reached them and there may still be seen on the feathers of the woodpecker marks where the water touched him.

The olla in which Tcuhu was concealed floated far away into the southwest, but that containing Earth Doctor went northwest. The third, in which was Tohouse, went east. The tracks of the ollas of Earth Doctor and Tohouse Doctor crossed several times and as they did so Earth Doctor addressed the other as Elder Brother. There were seven persons saved from the flood, and these were called brothers. Their names are Tcuwut, Tcuhu, Tohouse, Buzzard, Woodpecker, Humming-bird, and an unknown. When the water had subsided these seven brothers held a council to determine the position of the middle of the earth. Woodpecker was sent to the east and Humming-bird to the west, to find it. Three times they returned without success, but on their fourth meeting they reported that they had found the middle of the earth.

Tcuhu plucked a hair from the right side of his head and, putting it in his mouth, drew it back and forth, stretching it and miraculously forming a snake, which he laid on the earth at his north side. He took a hair from the left side of his head and, stretching it out as before, created a second snake, which he laid at the west side. He then laid one at the south and another at the east.[1] These snakes prevent the water from flooding the land and cause it to flow in channels or rivers. Tcuhu created ants, which he put on the wet ground; these threw up hills that became dry land. After the water had subsided Earth Doctor, Tcuhu, and Tohouse set themselves to re-create men, having agreed not to inform one another what kind of beings each would make. To prevent one another from seeing their work they faced in different directions—Earth Doctor to the east, Tohouse to the south, and Tcuhu to the west. When their creations were finished it was found that Tcuhu had made men similar in form to those now living, but that Tohouse's men had webbed fingers like ducks, while those created by Earth Doctor had but one leg each and subsisted not on food, but on smells, which they inhaled. Tcuhu asked Tohouse why he made his men with webbed fingers. "That they may live in water," responded Tohouse. Tcuhu was dissatisfied with the beings made by Tohouse, and he threw them into the water, where they became ducks. The creations of Earth Doctor became fishes and snakes; he was much pleased with his children, which descended into the Underworld where he daily visits them.

When Earth Doctor stuck his staff into the ground to cause the flood and water covered the earth, most of the people perished, but some escaped and followed White Feather, who fled to the top of Superstition Mountains. The water rose, covering all the valley until it was as high as the line of white sandstone which is a conspicuous landmark. White Feather, surrounded by his followers, tried all his magic in vain to prevent the further rise of the flood. When he saw he was powerless to prevent this, he gathered all his people and consulted them, saying, "I have exhausted all magic powers but one, which I will now try." Taking in his left hand a medicine-stone from his pouch, he held it at arm's length, at the same time extending his right hand toward the sky. After he had sung four songs he raised his hand and seized the lightning and with it struck the stone which he held. This broke into splinters with a peal of thunder and all his people were transformed into the pinnacles of stone which can now be seen projecting from the summit of one of the peaks of the Superstition Mountains.

[1] It is thought that dreams come from the east and that the west sends cold.

The followers of Tcuhu and Tohouse united and built a house. Four days after this house was begun Tcuhu sent Tohouse to visit a people he had created, in order to learn what language they spoke. When Tohouse found that they spoke Apache and so reported, Tcuhu assigned them to the land of cold wind and rain. Tcuhu again sent Tohouse to discover whether there were other people on the earth; returning after a time the latter reported to Tcuhu that he had heard of men speaking Mohave, Yuma, and Maricopa, but not Pima. After four days Tcuhu again sent Tohouse to search for any men allied to his people, and he reported finding those who continually said, *Ston, ston*, "it is hot." He returned and told Tcuhu he had found lost brothers, because he had detected in their speech a Pima word. Tcuhu said they must be his people; he said also, "I will give them dark cool nights in which they can sleep, and I will send them dreams and they shall be able to interpret these dreams." All these peoples were gathered into the house Tcuhu had built [Casa Grande?]. But after a while there were bickerings and quarrels among men. The Apache left for the mountains where they said they also would have dreams and thus they became hereditary enemies of the Pima. At this time all the Pima inhabited the Salt River Valley, not far from the site of the present Phoenix.

White Feather and his people lived in a settlement called Sturavrik Cívanavâaki, near Tempe, the site of which is now a large mound. According to some legends, this chief was the first man who taught the Pima irrigation and he showed them also how to plant corn. Through his guidance his people became prosperous and all the Pima congregated at his settlement to trade.

The people of a settlement near Mesa could not build a canal because the ground in the vicinity was so hard, so they asked Tcuhu to aid them. He sang magic songs for four days, and at the fourth song the ground softened and the people easily excavated the ditch, but the water would not run in it. Tcuhu found he was powerless to make it do so and advised them to invite Towa Quaatam Ochse,[1] an old woman who lived in the west by the great water, to aid them. She was summoned and sent word to the Mesa people to assemble in their council-house and await her coming. They gathered and awaited her coming but she did not appear. At night a man passing that way saw her standing at the highest point of the canal blowing "medicine" along the ditch. Later there came a great wind that dug out a wide channel and water ran in the canal. The Casa Grande people, it is said, learned the art of irrigating from those living on the site of Tempe, who were taught by Tcuhu.

Feather-plaited Doctor was an evil-minded youth who lived at Wukkakotk, north of Casa Grande. Tonto[2] visited Feather-plaited Doctor, but the latter would not notice him, although he made the customary offering of four cigarettes. Three times Tonto repeated his visit to Feather-plaited Doctor, and on the third visit the latter accused him of being a gossip and on that account refused to have anything to do with him. On the last visit he told Tonto that although he did not like him he did not object to his visits, but he warned him, if he wished to see him, not to gamble at night and not to have anything to do with women without his permission. At that time there was a man who wished to gamble with Tonto but, forewarned, the latter refused. When Tonto was asked the reason, he revealed his promise to Feather-

[1] This personage corresponds to Hazrinwuqti, or Woman of Hard Substance (shell, stone, and turquoise) of the Hopi.

[2] The writer's interpreter claimed that *tonto* is a pure Pima word, hence the fact that in Spanish it signifies "foolish" would seem to be fortuitous. It appears in the term *Totonteac*, used by early Spaniards to designate a "kingdom," sometimes regarded as synonymous with *Moki*, also a Pima word. On the theory that *totonteac* is pure Pima, the writer derives it from *to-ton*, and *toac* or *teac*, a termination which occurs in the name of a mountain (Kihutoac, "mountain of the *kihu*, or carrying basket"). The term Totonteac would mean "mountains of the Tontos."

When first mentioned Totonteac was reputed to be a kingdom of great power; later it was found to be a hot spring surrounded by a few mud houses. In the opinion of the writer, the hot springs in the lower part of the Tonto Basin, near the Roosevelt Dam, may represent the locality of the so-called fabulous Totonteac.

plaited Doctor and said he must get permission. Tonto was allowed by Feather-plaited Doctor to gamble with this man, but was warned not to play again if he were beaten; but should he win twice he must desist by all means from further playing.

The game at which Tonto gambled was that known as the "cane game," and on this occasion Feather-plaited Civan marked the canes. Tonto played and won twice from his opponent; he would not play a third time, but carried all he had won to the house of Feather-plaited Civan. Whenever he played with the marked canes, he won, so that one of his opponents consulted Tcuhu to learn the reason. Tcuhu informed him that the sticks were endowed with magic derived from the sun, which gave them supernatural power over all others.

Tcuhu then told a maid to search under trees and gather in the early morning the feathers of eagles, crows, buzzards, and hawks, bind them together, and bring them to him. After these feathers had been brought Tcuhu instructed her to strip every feather to its midrib and cut each into short sections. Having roasted the feathers with meal of popcorn, the girl placed them on a basket tray. She was then instructed to fill two small bowls with "medicine" and to carry them to a spring near the place where Tonto was going to play the next game. Before Tonto began this game he declared he was thirsty and started for the spring, kicking before him the stone ball. When he reached the spring he perceived the girl and fell in love with her. She promised to marry him if her parents were willing. The maid handed Tonto a drink of the "medicine" instead of water; at the first draught he began to tremble; a second caused him to shake violently, and at the third feathers began to form all over his body, and shortly afterward he took the form of a bird resembling the eagle. When the maid had witnessed this metamorphosis, she sought the man with whom Tonto had agreed to gamble and told him Tonto had become a bird, at the same time pointing to an eagle perched on a rock near the spring. The man tried to shoot Eagle, but he flew away and alighted on the top of a peak of the Superstition Mountains, which shook violently as Eagle landed thereon.[1] In his flight Eagle carried off the maid, now called Baat, with whom he lived. He killed many people dwelling near his home and heaped their bodies in a great pile near the cave in which he made his home. He became so dangerous, in fact, that the survivors asked Tcuhu's aid; he promised to come in four days but did not do so. A new messenger was sent with the same request and he again promised to come in four days but again failed to fulfill his promise. Tcuhu told the messenger to bring him ashes, and the man brought mesquite charcoal, which he did not wish. Tcuhu procured charcoal from cactus fruit and, having ground the seeds into fine meal, he fashioned it into the form of a big knife. He then procured a flexible stick, such as grows in the White Mountains, and other pointed sticks resembling bone awls. Having made four of these sticks, he sharpened them and started forth to overcome Eagle, leaving word that if he were killed a smoke would be seen for four days, but that if he killed Eagle, a cloud would hang over the place of the combat. Tcuhu traveled eastward a long distance and came to the mountain where Eagle lived, in between perpendicular precipices, surrounded by deep fissures. Tcuhu metamorphosed himself into a fly and hid himself in this fissure, where he slept that night. On the following day he changed himself back into a man, stuck the sticks into the crevice of the cliff, and by their help climbed up to the crag in which Eagle had his home.[2]

[1] A mountain in the Superstition Range, resembling a monster bird (eagle), is now pointed out from the Roosevelt Dam road.

[2] This story of Eagle seems to be a variant of that previously recorded in which the avian being killed was the monster Hok. Here Tcuhu found only a captive woman, who said the monster had gone to procure victims. Tcuhu having revealed his mission, they agreed on a signal, and he changed into a fly. When Eagle returned, although suspicious, he went to sleep and the woman whistled three times. At the last whistle Tcuhu returned to human form and decapitated Eagle, throwing his head, limbs, and body to the four world quarters. Then the woman sprinkled "medicine" on a pile of bones, the remains of former victims, and brought them to life. Thereupon all descended from the mountain over which hovered dense clouds, the signal that the monster was dead.

HISTORY

No prehistoric structure in the Southwest has been more frequently described and figured than Casa Grande. This venerable ruin is one of the few in what is now the United States that bears a Spanish name reaching back to the close of the seventeenth century. Some of the more important contributors to its history are mentioned in the following pages.[1]

It was once believed that this celebrated ruin was one of the sojourning places of the Aztec on their southerly migration in ancient times, and was generally supposed to be identical with the Chichilticalli (Aztec, "Red House") mentioned by Fray Marcos de Niza in 1539 and by Pedro de Castañeda and other chroniclers of the expedition of Francisco Vasquez de Coronado in 1540–1542. There seems no foundation for the association of the people of Casa Grande with the Aztec and considerable doubt exists whether the ruin was ever visited by Coronado or any of his companions.

Almost every writer on the Southwest who has dealt with the ruins of Arizona has introduced short references to Casa Grande, and many other writers have incidentally referred to it in discussing the antiquities of Mexico and Central America. Among the former are Browne,[2] Ruxton,[3] and Hinton,[4] while among the latter may be mentioned Prescott,[5] Brantz Mayer,[6] Brasseur de Bourbourg,[7] Humboldt,[8] Mühlenpfordt,[9] and Squier.[10]

As there are several very complete accounts of Casa Grande, and as these are more or less scattered through publications not accessible to all students, it is thought best to quote at least the earliest of these at considerable length. As will be seen, most of these descriptions refer to the historic building, while only one or two shed light on the great compounds, which formerly made up this extensive settlement.[11]

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[1] The writer is indebted to Mr. F. W. Hodge, ethnologist in charge of the Bureau of American Ethnology, for some of the historical material used in this portion of the present work.

[2] Browne (J. Ross), Adventures in the Apache Country, pp. 114–124, New York, 1869.

[3] Ruxton (George Frederic), Sur la migration des Anciens Mexicains; in *Nouvelles Annales des Voyages*, 5me sér., t. XXII, pp. 40, 46, 52, Paris, 1850.

[4] Hinton (Richard J.), The Great House of Montezuma; in *Harper's Weekly*, XXXIII, New York, May 18, 1889.

[5] Prescott (Wm. H.), History of the Conquest of Mexico, III, p. 383, Philadelphia [c. 1873].

[6] Mayer (Brantz), (1) Mexico, Aztec, Spanish, and Republican, II, p. 396, Hartford, 1853. (2) Observations on Mexican History and Archæology; in *Smithsonian Contributions to Knowledge*, IX, p. 15, Washington, 1856.

[7] Brasseur de Bourbourg (M. l'Abbé), Histoire des nations civilisées du Mexique et de l'Amérique-Centrale, t. 2, p. 197, Paris, 1858.

[8] Humboldt (Friedrich H. Alex. de), Essai politique sur le royaume de la Nouvelle-Espagne, t. I, p. 297, Paris, 1811.

[9] Mühlenpfordt (Eduard), Versuch einer getreuen Schilderung der Republik Mejico, Bd. II, p. 435, Hannover, 1844.

[10] Squier (E. G.), New Mexico and California; in *American Review*, Nov., 1848.

[11] See Winship, The Coronado Expedition, in *14th Ann. Rep. Bur. Ethnol.*

Recent students of the route of the Coronado expedition have followed Bandelier, who has shown that the army may have traveled down the San Pedro River for part of its course, thus leaving Casa Grande several miles to the west.

Discovery and Early Accounts

The first known white man to visit Casa Grande was the intrepid Jesuit Father Eusebio Francisco Kino, or Kuehne, the pioneer missionary among the Opata, Pima, Papago, and Sobaipuri Indians from 1687 until his death in 1711. In 1694 Lieut. Juan Mateo Mange, nephew of Don Domingo Jironza Petriz de Cruzate, the newly appointed governor of Sonora, was commissioned to escort the missionaries on their perilous journeys among the strange and sometimes hostile tribes of the region. In June of that year, while making a reconnoissance toward the northeast from Kino's mission of Dolores on the western branch of the Rio Sonora, Mange heard from the Indians of some *casas grandes*, massive and very high, on the margin of a river which flowed toward the west. The news was communicated to Kino and shortly afterward was confirmed by some Indians who visited Dolores from San Xavier del Bac, on the Rio Santa Cruz below the Indian village of Tucson. In November (1694) Kino went from his mission on a tour of discovery, finding Casa Grande to be as reported, and saying mass within its walls.[1] The house was described as large and ancient and certainly four stories high. In the immediate vicinity were to be seen the ruins of other houses, and in the country toward the north, east, and west were ruins of similar structures. Kino believed that Casa Grande was the ruin (Chichilticalli) spoken of in 1539 by Fray Marcos de Niza,[2] whose journey was followed in the next year by Coronado's famous expedition. Ortega, Kino's biographer, speaks of the ancient traditions of the Mexicans (Aztec), favorably received by all the historians of New Spain, that this Gila locality, as well as the Casas Grandes of Chihuahua, was one of the stopping places on their migration southward to the Valley of Mexico. This belief was prevalent during the period, and Casa Grande on the Gila is frequently marked on early maps as an Aztec sojourning place. For this reason it was also commonly designated Casa de Montezuma.

Three years later, in the autumn of 1697, Kino, accompanied by Mange, again started from his mission of Dolores and traveled across the country to the Rio San Pedro, on which stream, at a point west of the present Tombstone, the missionary was joined by Capt. Cristóbal M. Bernal with 22 soldiers. Proceeding down the San Pedro, the party reached the Gila on November 16, and on the 18th arrived at Casa Grande.

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[1] Mange in *Doc. His. Mex.*, 4th ser., I, 250, 259, Mexico, 1856.

[2] (Ortega.) Apostolicos afanes de la Compania de Jesus, escrito por un Padre de la misma sagrada religion de su Provincia de Mexico, p. 253, Barcelona, 1754.

MANGE'S NARRATIVE

Mange's account [1] of the famous ruin (pls. 8, 9) is so interesting and so important for comparison with the condition of Casa Grande as it exists to-day that it is here given in full:

On the 18th we continued westward across an extensive plain, barren and without pasture, and at a distance of 5 leagues we discovered on the other side of the river other houses and buildings. Sergeant Juan Bautista de Escalante and two companions swam across to reconnoiter and reported that the walls were 2 yards thick, like a castle, and that there were other ruins in the vicinity, all of ancient workmanship. We continued westward and after making 4 more leagues we arrived at noon at the Casas Grandes, in which Father Kino said mass, having till then kept his fast. One of the houses is a great building, the main room in the middle being four stories high and the adjoining rooms on the four sides of it being three stories, with walls 2 yards thick, of strong mortar and clay, so smooth on the inside that they look like planed boards and so well burnished that they shine like Puebla earthenware; the corners of the windows, which are square, being very straight and without any hinges or crosspieces of wood, as if they had made them with a mold or frame: and the same is true of their doors, although these are narrow, whereby it might be known that this is the work of Indians. The building is 36 paces long and 21 paces wide, of good architecture.

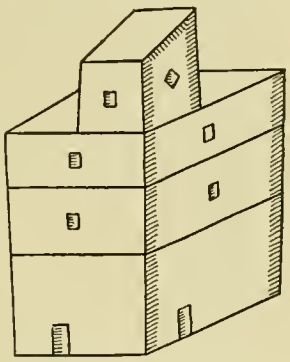

FIG. 1. Sketch of Casa Grande ruin (Mange).

A crossbow shot farther on 12 other houses are seen, half tumbled down, also with thick walls and all with roofs burnt, except one room beneath one house, with round beams, smooth and not thick, which appear to be of cedar or savin, and over them reeds very similar to them and a layer of mortar and hard clay, making a ceiling or story of very peculiar character. In the neighborhood many other ruins may be noted and (*terremotos?*) [heaps of earth], which inclose two leagues, with much broken pottery of vessels and pots of fine clay, painted in various colors, resembling the Guadalajara pots of this country of New Spain, whence it is inferred that the settlement or city was very large, inhabited by a civilized race, under a regular government. This is evidenced by a main ditch which branches off from the river into the plain, surrounding the city which remains in the center of it, in a circumference of 3 leagues, being 10 yards wide and 4 feet deep, by which they diverted perhaps one-half of the river, that it might serve them for defense, as well as to provide water for their city subdivisions and to irrigate their crops in the vicinity. The guides said that at a distance of a day's journey there are other edifices [2] of the same kind of workmanship, toward the north, on the other bank of the river in another ravine which joins the one they call Verde, and that they were built by people who came from the region of the north, their chief being called El Siba, which according to their defini-

FIG. 2. Ground plan of Casa Grande ruin (Mange).

[1] Mange, op. cit., pp. 282–284. The original manuscript journal in the Archives of Mexico contains a sketch and a ground plan, which are introduced with some changes in an extract from Mange's diary published in Schoolcraft's Indian Tribes (III, 301–303, 1853), from a translation by Buckingham Smith, but these do not appear in the printed copy of Mange's Diary in *Doc. Hist. Mex.* The sketch and plan (figs. 1, 2) reproduced in the present work are from photographs of the original manuscript, procured through the courtesy of Dr. Nicolas León of the City of Mexico. The accompanying translation is from the published Spanish account.

[2] Evidently those now in ruins near Phoenix, Tempe, and Mesa, in the Salt River Valley.—J. W. F.

tion in their language means "the bitter or cruel man," and that through the bloody wars which the Apache waged against them and the 20 tribes allied with them, killing many on both sides, they laid waste the settlements, and part of them, discouraged, went off and returned northward, whence they had started years before, and the majority toward the east and south; from which statements we inferred that it was very likely that these were the ancestors of the Mexican nation, judging by their structures and relics, such as those that are mentioned under the thirty-fourth degree [of latitude] and those in the vicinity of the Fort of Janos under the twenty-ninth degree, which are also called Casas Grandes, and many others which, we are told, are to be found as far as the thirty-seventh and fortieth degrees north latitude. On the bank of the river, at a distance of 1 league from the Casas Grandes, we found a rancheria in which we counted 130 souls, and, preaching to them on their eternal salvation, the Father baptized 9 of their little ones, although at first they were frightened at the horses and soldiers, not having seen any till then.

Early in March, 1699, during a seventh tour of Pimería, as the Pima country was called, Father Kino made his final visit to Casa Grande,[1] and in 1701 he prepared a map of the country, remarkably accurate for its day, in which Casa Grande is charted for the first time.

The next visits to the celebrated ruin of which there is record were made in 1736–37 by Father Ignacio Keller, of the mission of Suamca, not far from the present Nogales, reference to which is made in the Rudo Ensayo. Again, in 1744, the Jesuit father, Jacobo Sedelmair, of the mission of Tubutama, on the Rio Altar, went to the Gila near Casa Grande in an endeavor to cross the northern wilderness from this point to the Hopi (Moqui) country. He describes what was evidently the present main structure as a large edifice with the central part of four stories and the surrounding wings of three stories.[2]

"RUDO ENSAYO" NARRATIVE

Twenty years later, that is, about 1762, another definite description of the ruin is given by the author of the anonymous Rudo Ensayo,[3] attributed to Father Juan Mentuig, or Nentoig, of the mission of Guazavas, on the Rio Bavispe, a branch of the Yaqui. The author seems not to have visited the ruins himself but to have gathered his information from other missionaries, notably Father

[1] (Ortega,) Apostolicos Afanes, etc., op. cit., p. 276.

[2] *Documentos para la Historia de México*, 3e série, IV, 847, 1853–57. Sedelmair's account, as Bancroft (Native Races, IV, 623, 1882) has pointed out, is a literal copy of Mange's Diary in the Archives of Mexico. See also Orozco y Berra, Geografía, p. 108, 1864.

[3] Rudo Ensayo tentativa de una prevencional descripcion Geographica de la Provincia de Sonora, etc., por un Amigo del Bien Comun, San Augustin de la Florida, Año de 1763. This work, the original of which is in the Department of State of Mexico and a duplicate copy in the Royal Academy of History at Madrid, was published by Buckingham Smith. Under the title Descripcion geografica natural y curiosa de la Provincia de Sonora (1764) this essay appears in the *Documentos para la Historia de Mèxico*, 3e série, IV 503, and from it the part pertaining to Casa Grande was translated by Buckingham Smith and published in Schoolcraft's Indian Tribes, III, 304–306, 1853. An English translation of the Rudo Ensayo, by Eusebio Guitéras, appears in the *Records of the American Catholic Historical Society*, V, 110–264, Phila., 1894.

Keller, to whom reference has been made. This interesting document says:[1]

Pursuing the same course for about 20 leagues from the junction [of the San Pedro], the Gila leaves on its left, at the distance of 1 league, the Casa Grande, called the House of Moctezuma because of a tradition current among the Indians and Spaniards, of this place having been one of the abodes in which the Mexicans rested in their long transmigrations. This great house is four stories high, still standing, with a roof made of beams of cedar or tlascal and with most solid walls of a material that looks like the best cement. It is divided into many halls and rooms and might well lodge a traveling court. Three leagues distant and on the right bank of the river there is another similar house but now much demolished, which from the ruins can be inferred to have been of vaster size than the former. For some leagues around, in the neighborhood of these houses, wherever the earth is dug up, broken pieces of very fine and variously colored earthenware are found. Judging from a reservoir of vast extent and still open, which is found 2 leagues up the river, holding sufficient water to supply a city and to irrigate for many leagues the fruitful land of that beautiful plain, the residence of the Mexicans there must not have been a brief one. About half a league west from this house a lagoon is seen that flows into the river, and although the surface is not very large it has been impossible to measure its depth by means of cords tied together, etc.

The Pima tell of another house, more strangely planned and built, which is to be found much farther up the river. It is in the style of a labyrinth, the plan of which, as it is designed by the Indians on the sand, is something like the cut on the margin; but it is more probable that it served as a house of recreation than as a residence of a magnate.[2] I have heard of other buildings, even more extensive and more correct in art and symmetry, through Father Ignatius Xavier Keller, although I can not recollect in what place of his apostolic visits. He spoke of one that measured in frontage, on a straight line, half a league in length and apparently nearly as much in depth, the whole divided into square blocks, each block three and four stories high, though greatly dilapidated in many parts; but in one of the angles there was still standing a massive structure of greater proportions, like a castle or palace, five or six stories high.

Of the reservoir, as in the case of the one spoken of above, the reverend father said that it not only lay in front of the house but that, before its outlet reached there, it divided into many canals through which the water might enter all the streets, probably for cleansing purposes, when such was desired, as is done in Turin and other cities of Europe and was done even in Mexico in olden times. This last Casa Grande is perhaps the same as that of which we spoke before and which lies on the other side of the river, for those who have been there agree that there are ruins not merely of a single edifice but of a large town.

GARCÉS' NARRATIVE

The next recorded visit to Casa Grande is that of Lieut. Col. Juan Bautista de Anza, accompanied by a force of 239 persons, including Fathers Francisco Garcés, Pedro Font, and Tomás Eixarch, who were among the first Franciscans to serve as missionaries in this region after the expulsion of the Jesuits in 1767. During an excursion from Tubac, in October, 1775, the party approached the Gila on the 30th, and on the following day, Anza having decided to rest, an opportunity was given of "going to see the Casa Grande that they call [Casa] de Moctezuma." Garcés continues:[3]

[1] Translation by Eusebio Guitéras, op. cit., pp. 127–128.

[2] It is shown elsewhere (in *Amer. Anthr.*, N. S., IX, pp. 510–512, 1907) that this is a misconception. The Indians did not intend to suggest a dwelling but the ground plan of a game.—J. W. F.

[3] In Coues, On the Trail of a Spanish Pioneer: The Diary and Itinerary of Francisco Garcés. . . in 1775–76, I, 66, 1900.

We [Garcés and Font] traveled about 3 leagues southeast and arrived at the casa, whose position is found in latitude 33° 03′ 30″. For the present condition of this casa I refer to the description thereof that Padre Font has given; and in the end will speak of that which I have been enabled to conjecture from what I saw and learned at Moqui.

Later, on July 4, 1776, while at the Hopi (Moquí) village of Oraibi, in northeastern Arizona, Garcés, who had been inhospitably received by the natives, learned of the hostility that existed between the Hopi and the Pima.[1]

This hostility had been told me by the old Indians of my mission, by the Gileños, and Cocomaricopas; from which information I have imagined (*he discurrido*) that the Moqui nation anciently extended to the Rio Gila itself. I take my stand (*fundome*, ground myself) in this matter on the ruins that are found from this river as far as the land of the Apaches; and that I have seen between the Sierras de la Florida and San Juan Nepomuzeno. Asking a few years ago some Subaipuris Indians who were living in my mission of San Xavier, if they knew who had built those houses whose ruins and fragments of pottery (*losa*, for *loza*) are still visible—as, on the supposition that neither Pimas nor Apaches knew how to make (such) houses or pottery, no doubt it was done by some other nation—they replied to me that the Moquis had built them, for they alone knew how to do such things; and added that the Apaches who are about the missions are neither numerous nor valiant; that toward the north was where there were many powerful people; "there went we," they said, "to fight in former times (*antiguamente*); and even though we attained unto their lands we did not surmount the mesas whereon they lived." It is confirmatory of this that I have observed among the Yabipais some circumstances bearing upon this information; for they brought me to drink a large earthenware cup very like the potsherds that are found in the house called (Casa) de Moctezuma and the Rio Gila. Asking them whence they had procured it, they answered me that in Moqui there is much of that. As I entered not into any house of Moqui, I could not assure myself by sight; but from the street I saw on the roofs some large, well-painted ollas. Also have the Pimas Gileños told me repeatedly that the Apaches of the north came anciently to fight with them for the casa that is said to be of Moctezuma; and being sure that the Indians whom we know by the name of Apaches have no house nor any fixed abode, I persuaded myself that they could be the Moquis who came to fight; and that, harassed by the Pimas, who always have been numerous and valiant, they abandoned long ago these habitations on the Rio Gila, as also have they done this with that ruined pueblo which I found before my arrival at Moqui and of which I have made mention above; and that they retired to the place where now they live, in a situation so advantageous, so defensible, and with such precautions for self-defense in case of invasion.

FONT'S NARRATIVE

It is unfortunate that Garcés did not describe Casa Grande independently of his companion, Father Font, but most fortunate that the description and plan of the latter exist, as they afford valuable data for comparison with Mange's account of 1697 and with the present condition of the ruin. Font's narrative reads as follows:[2]

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[1] Ibid., II, 386–387.

[2] Diario á Monterey por el Rio Colorado del Padre Fr. Pedro Font, 1775. The original manuscript is in the John Carter Brown Library, Providence, R. I. A recent copy of it, from which the accompanying translation was made and the plan reproduced, is in the archives of the Bureau of American Ethnology. See also Notice sur la grande maison dite de Moctecuzoma, in Ternaux-Compans, Voyages, IX, app. VII, 383–386, 1838.

31st day [of October, 1775], Tuesday. I said mass, which some heathen Gila Indians heard with very quiet behavior. The señor comandante decided to give his men a rest to-day from the long journey of yesterday, and in this way we had an opportunity of going to examine the Casa Grande which they call the house of Moctezuma, situated at 1 league from the River Gila and distant from the place of the lagoon [Camani, where they had camped] some 3 leagues to the east-southeast; to which we went after mass and returned after midday, accompanied by some Indians and by the governor of Vturitúc, who on the way told us a history and tradition which the Pima of Gila River have preserved from their ancestors concerning said Casa Grande, which all reduces itself to fictions mingled confusedly with some catholic truths, which I will relate hereafter. I took observations at this place of the Casa Grande, marked on the map which I afterward drew, with the letter A, and I found it to be without correction in 33° 11′ and with correction in 33° 3½′; and thus I say: In the Casa Grande of the River Gila, 31st day of October of 1775, meridional altitude of the lower limb of the sun, 42° 25′. We examined with all care this edifice and its relics, whose ichnographic plan [fig. 3] is that which here I put, and for its better understanding I give the description and explanation which follow. The Casa Grande, or Palace of Moctezuma, may have been founded some 500 years ago, according to the stories and scanty notices that there are of it and that the Indians give; because, as it appears, the Mexicans founded it when in their transmigration the devil took them through various lands until they arrived at the promised land of Mexico, and in their sojourns, which were long, they formed settlements and built edifices. The site on which this casa is found is level in all directions and distant from Gila River about 1 league, and the ruins of the houses which formed the settlement extend more than a league to the east and to the other points of the compass; and all this ground is strewn with pieces of jars, pots, plates, etc., some plain and others painted various colors—white, blue, red, etc.—an indication that it was a large settlement and of a distinct people from the Pima of the Gila, since these know not how to make such pottery. We made an exact inspection of the edifice and of its situation and we measured it with a lance for the nonce, which measurement I reduced afterward to geometrical feet, it being approximately the following: The casa is an oblong square and laid out perfectly to the four cardinal points, east, west, north, and south, and roundabout are some ruins which indicate some inclosure or wall which surrounded the house, and other buildings,

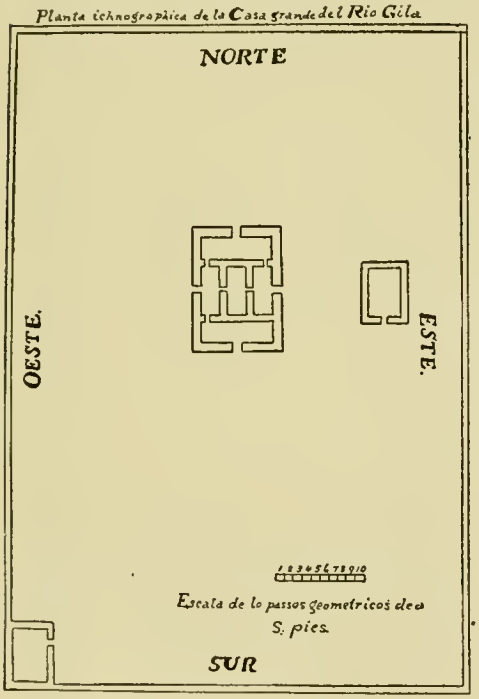


FIG. 3. Ground plan of Compound A (Font).

particularly at the corners, where it seems there was some structure like an interior castle, or watch tower, for in the corner which lies at the southwest there is a piece of ground floor with its divisions and an upper story. The exterior inclosure [fig. 3] is from north to south 420 feet long and from east to west 260. The interior of the casa is composed of five halls, the three equal ones in the middle and one at each extremity larger. The three (middle) halls have a length from north to south of 26 feet and a width from east to west of 10. The two halls of the extremities (one at each end) are from north to south 12 feet and from east to west 38. The halls are some 11 feet high and all are equal in this respect. The doors of communication are 5 feet high and 2 feet wide and are all about equal except the four first of the four entrances, which it appears were twice as wide. The thickness of the interior walls is 4 feet and they are well laid in mortar, and of the exterior ones 6 feet. The casa is on the outside from north to south 70 feet long and from east to west 50 feet wide. The walls have a smooth finish on the outside. In front of the door of the east, separated from the casa, there is another building with dimensions from north to south 26 feet and from east to west 18, exclusive of the thickness of the walls. The woodwork was of pine, apparently, and the nearest mountain range that has pines is distant some twenty and five leagues, and also has some mesquite. The whole edifice is of earth, and according to the signs it is a mud wall made with boxes of various sizes. From the river and quite a good distance there runs a large canal, by which the settlement was supplied with water. It is now very much choked. Finally, it is known that the edifice had three stories, and if that which can be found out from the Indians is true, and according to the indications that are visible, it had four, the basement of the casa deepening in the manner of a subterranean apartment. To give light to the apartments there is nothing but the doors and some circular openings in the midst of the walls which face to the east and west, and the Indians said that through these openings (which are pretty large) the Prince, whom they call El Hombre Amargo [The Bitter Man] looked out on the sun when it rose and set, to salute it. There are found no traces of staircases, from which we judged that they were of wood and were destroyed in the conflagration which the edifice suffered from the Apache. The story which the governor of Vturitúc related to us in his Pima language, which was interpreted to us by a servant of the señor comandante, the only interpreter of that language, is as follows: He said that in very olden time there came to that land a man who because of his evil disposition and harsh sway was called The Bitter Man; that this man was old and had a young daughter; and that in his company there came another man who was young, who was not his relative nor anything, and that he gave him his daughter in marriage, who was very pretty, the young man being handsome also; and that the said old man had with him as servants the Wind and the Storm-cloud. That the old man began to build that Casa Grande and ordered his son-in-law to go and fetch beams for the roof of the house. That the young man went far off; and as he had no ax, nor anything else with which to cut the trees, he tarried many days and at the end he came back without bringing any beams. That the old man was very angry and told him that he was good for nothing; that he should see how he himself would bring beams. That the old man went very far off to a mountain range where there are many pines and that, calling on God to help him, he cut many pines and brought many beams for the roof of the house. That when this Bitter Man came, there were in that land neither trees nor plants; he brought seeds of all and reaped very large harvests with his two servants, the Wind and the Storm-cloud, who served him. That by reason of his evil disposition he grew angry with the two servants and turned them away, and they went very far off; and as he could no longer harvest any crops through lack of the servants, he ate what he had gathered and came near dying of hunger. That he sent his son-in-law to call the two servants and bring them back but he could not find them, seek as he might. That thereupon the old man went to seek them and, having found them, brought them once more into his service; with their aid he once more had large crops and thus he continued for

many years in that land; and after a long time they went away and nothing more was heard of them. He [the governor] also said: That after the old man there came to that land a man called The Drinker and he grew angry with the people of that place and sent much water, so that the whole country was covered with water, and he went to a very high mountain range, which is seen from there and which is called The Mountains of the Foam (*Sierra de la Espuma*), and he took with him a little dog and a coyote. (This mountain range is called "of the foam" because at the end of it, which is cut off and steep like the corner of a bastion, there is seen high up near the top a white brow as of rock, which also continues along the range for a good distance, and the Indians say that this is the mark of the foam of the water, which rose to that height.) That The Drinker went up, and left the dog below that he might notify him when the water came so far, and when the water reached the brow of the Foam the dog notified The Drinker, because at that time the animals talked, and the latter carried him up. That after some days The Drinker Man sent the Rose-sucker (*Chuparosas*) and the Coyote to bring him mud; they brought some to him and of the mud he made men of different kinds, and some turned out good and others bad. That these men scattered over the land, upstream and downstream; after some time he sent some men of his to see if the other men upstream talked; these went and returned, saying that although they talked they had not understood what they said, and that The Drinker Man was very angry, because those men talked without his having given them leave. That next he sent other men downstream to see those who had gone that way and they returned, saying that they had received them well, that they spoke another tongue, but that they had understood them. Then The Drinker Man told them that those men downstream were the good men and that these were such as far as the Opa, with whom they are friendly; and that the others upstream were the bad men and that these were the Apache, who are their enemies. He [the governor] said also that at one time The Drinker Man was angry at the people and that he killed many and transformed them into saguaros [giant cacti], and that on this account there are so many saguaros in that country. (The saguaro is a tree having a green trunk, watery, rather high, and uniformly round, and straight from foot to top, with rows of large spines from above downward; it usually has two or three branches of the same character, which look like arms.) Furthermore he said: That at another time The Drinker was very angry with the men and that he caused the sun to come down to burn them, and that he was making an end of them; that the men begged him much not to burn them and that thereupon The Drinker said that he would no longer burn them; and then he told the sun to go up but not as much as before, and he told them that he left it lower in order to burn them by means of it if ever they made him angry again, and for this reason it is so hot in that country in summer. He [the governor] added that he knew other stories, that he could not tell them because the time was up and he agreed to tell them to us another day; but as we had laughed a little at his tales, which he related with a good deal of seriousness, we could not get him afterward to tell us anything more, saying that he did not know any more. This whole account or story I have reproduced in the dialect here given, because it is more adapted to the style in which the Indians express themselves.

GROSSMAN'S NARRATIVE

Regarding the story of the origin of Casa Grande, it may be well to incorporate here the Pima myth regarding the ruin and the description of the structure as given by Capt. F. E. Grossman in 1871:[1]

The Pimas, however, claim to be the direct descendants of the chief Sŏ′-hŏ above mentioned. The children of Sŏ′-hŏ inhabited the Gila River valley, and soon the

[1] In *Smithsonian Report* for 1871, pp. 408–409, Washington, 1873.

people became numerous. One of the direct descendants of Sŏ′-hŏ, King Si′-va-no, erected the Casas Grandes on the Gila River. Here he governed a large empire, before—long before—the Spaniards were known. King Si′-va-no was very rich and powerful and had many wives, who were known for their personal beauty and their great skill in making pottery ware and ki′-hos (baskets which the women carry upon their heads and backs). The subjects of King Si′-va-no lived in a large city near the Casas Grandes, and cultivated the soil for many miles around. They dug immense canals, which carried the water of the Gila River to their fields, and also produced abundant crops. Their women were virtuous and indnstrious; they spun the native cotton into garments, made beautiful baskets of the bark of trees, and were particularly skilled in the manufacture of earthenware. (Remains of the old canals can be seen to this day, and pieces of neatly painted pottery ware are scattered for miles upon the site of the old city. There are several ruins of ancient buildings here, the best preserved one of which is said to have been the residence of King Si′-va-no. This house has been at least four stories high, for even now three stories remain in good preservation, and a portion of the fourth can be seen. The house was built square; each story contains five rooms, one in the center, and a room on each of the outer sides of the inner room. This house has been built solidly of clay and cement; not of adobes, but by successive thick layers of mortar, and it was plastered so well that most of the plastering remains to this day, although it must have been exposed to the weather for many years. The roof and the different ceilings have long since fallen, and only short pieces of timber remain in the walls to indicate the place where the rafters were inserted. These rafters are of pine wood, and since there is no kind of pine growing now within less than 50 miles of the Casas Grandes, this house must either have been built at a time when pine timber could be procured near the building site, or else the builders must have had facilities to transport heavy logs for long distances. It is certain that the house was built before the Pimas knew the use of iron, for many stone hatchets have been fonnd in the ruins, and the ends of the lintels over doors and windows show by their hacked appearance that only blunt tools were used. It also appears that the builders were without trowels, for the marks of the fingers of the workmen or women are plainly visible both in the plastering and in the walls where the former has fallen off. The rooms were about 6 feet in height, the doors are very narrow and only 4 feet high; round holes, about 8 inches in diameter, answered for windows. Only one entrance from the outside was left by the builders, and some of the outer rooms even had no communication with the room in the center. There are no stairs, and it is believed that the Pimas entered the house from above by means of ladders, as the Zuni Indians still do. The walls are perfectly perpendicular and all angles square.)

Early American Reports

The first American visitors to the Gila-Salt Basin appear to have been trappers, who found beaver fairly abundant, especially on the river and its tributaries. In 1825 the Patties,[1] father and son, were in the neighborhood of Casa Grande, and Paul Weaver, a trapper, is said to have inscribed his name on its walls in 1833. One of the most renowned of all the pathfinders and explorers of the West, Kit Carson, led a party of Americans from New Mexico to California in 1829–30. It may be safe to say that every traveler who rested a longer or shorter time at or near the neighboring Pima village of Blackwater visited Casa Grande. These earlier visitors left no record

[1] Pattie, Personal Narrative. See also J. Ross Browne, Adventures in the Apache Country, p. 118, New York, 1869. A figure of Casa Grande as it appeared in 1859, somewhat modified in Nadaillac, L'Amérique Préhistorique, is given in Cozzens, The Marvellous Country, London, 1874.

of their visits, however, or made at the most only meager references to the ruin. The most important accounts of Casa Grande in the middle of the nineteenth century are found in the official reports of the expedition to California led by General Kearny, in 1846, at the time of the Mexican war.

In 1846 Brantz Mayer erroneously ascribed the discovery of Casa Grande to Fathers Garcés and Font in 1773. He also mistook Font's measurements of the wall of the surrounding compound for that of the main edifice, for he writes:[1]

> Like most of the Indian works, it was built of unburned bricks, and measured about 450 feet in length, by 250 in breadth. Within this edifice they found traces of five apartments. A wall, broken at intervals by lofty towers, surrounded the building, and appeared to have been designed for defence.

The error of confounding the dimensions of the main structure with those of the surrounding wall, which Font gave with fair accuracy, has misled several later writers on the ruin.

EMORY'S NARRATIVE

In 1846 the ruins were visited by Lieut. Col. William H. Emory, with the advance guard of the "Army of the West." Under date of November 10 of that year Emory makes the following entry in his journal and includes an illustration which shows that the main building had not suffered greatly from the elements during the 70 years immediately following the time of Font and Garcés:[2]

> November 10.— . . . along the whole day's march were remains of zequias [acequias], pottery, and other evidences of a once densely populated country. About the time of the noon halt, a large pile, which seemed the work of human hands, was seen to the left. It was the remains of a three-story mud house, 60 feet square, pierced for doors and windows. The walls were 4 feet thick, and formed by layers of mud, 2 feet thick. Stanley made an elaborate sketch of every part; for it was, no doubt, built by the same race that had once so thickly peopled this territory, and left behind the ruins. [Fig. 4.]
>
> We made a long and careful search for some specimens of household furniture, or implement of art, but nothing was found except the corngrinder, always met with among the ruins and on the plains. The marine shell, cut into various ornaments, was also found here, which showed that these people either came from the seacoast or trafficked there. No traces of hewn timber were discovered; on the contrary, the sleepers of the ground floor were round and unhewn. They were burnt out of their seats in the wall to the depth of 6 inches. The whole interior of the house had been burnt out, and the walls much defaced. What was left bore marks of having been glazed, and on the wall in the north room of the second story were traced the following hieroglyphics [apparently not shown.]

From a Maricopa Indian Colonel Emory learned a version of the Pima tradition of the origin of Casa Grande:

> I asked him, among other things, the origin of the ruins of which we had seen so many; he said, all he knew, was a tradition amongst them, that in bygone days, a woman

[1] Mexico, As it Was and As It Is, p. 239, Philadelphia, 1847.

[2] Notes of a Military Reconnoissance, from Fort Leavenworth, in Missouri, to San Diego, in California, etc.; Ex. Doc. No. 41, 30th Cong., 1st sess., Washington, 1848.

of surpassing beauty resided in a green spot in the mountains near the place where we were encamped. All the men admired, and paid court to her. She received the tributes of their devotion, grain, skins, etc., but gave no love or other favor in return. Her virtue, and her determination to remain unmarried were equally firm. There came a drought which threatened the world with famine. In their distress, people applied to her, and she gave corn from her stock, and the supply seemed to be endless. Her goodness was unbounded. One day, as she was lying asleep with her body exposed, a drop of rain fell on her stomach, which produced conception. A son was the issue, who was the founder of a new race which built all these houses.

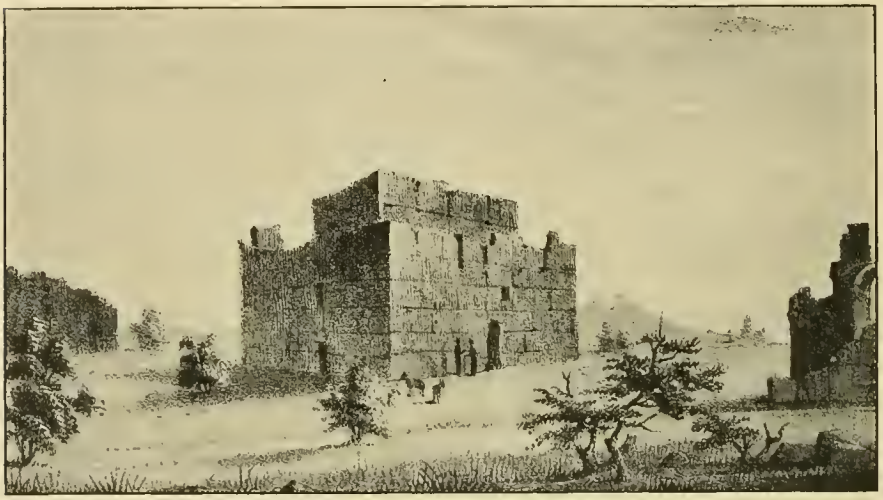


FIG. 4. Casa Grande in 1846 (after a drawing by Stanley).

JOHNSTON'S NARRATIVE

Capt. A. R. Johnston's account of the ruin, accompanied by a sketch of the elevation and a ground plan,[1] which is published with Emory's, reads as follows:

November 10.—Marched about 8, and after marching 6 miles, still passing plains which had once been occupied, we saw to our left the "Cara [Casa] de Montezuma." I rode to it, and found the remains of the walls of four buildings, and the piles of earth showing where many other had been. One of the buildings was still quite complete, as a ruin. [Fig. 5.] The others had all crumbled but a few pieces of low, broken wall. The large cara [casa] was 50 feet by 40, and had been four stories high, but the floors and roof had long since been burnt out. The charred ends of the cedar joists were still in the wall. I examined them, and found that they had not been cut with a steel instrument; the joists were round sticks, about 4 feet [*sic*] in diameter; there were four entrances—north, south, east, and west; the doors about 4 feet by 2; the rooms as below, and had the same arrangement on each story; there was no sign of a fireplace in the building; the lower story was filled with rubbish, and above it was open to the sky; the walls were 4 feet thick at the bottom, and had a curved inclination inwards to the top; the house was built of a sort of white earth and pebbles, probably containing lime, which abounded on the ground adjacent; the walls had been smoothed outside, and

[1] Reprinted in Squier, New Mexico and California; in *American Review*, Nov., 1848.

plastered inside, and the surface still remained firm, although it was evident they had been exposed to a great heat from the fire; some of the rooms did not open to all the rest, but had a hole a foot in diameter to look through; in other places, were smaller holes. About 200 yards from this building was a mound in a circle a hundred yards around; the center was a hollow, 25 yards in diameter, with two vamps or slopes going down to its bottom; it was probably a well, now partly filled up; a similar one was seen near Mount Dallas. A few yards further, in the same direction, northward, was a terrace, 100 yards by 70. About 5 feet high upon this, was a pyramid about 8 feet high, 25 yards square at top. From this, sitting on my horse, I could overlook the vast plain lying northeast and west on the left bank of the Gila; the ground in view was about 15 miles, all of which, it would seem, had been irrigated by the waters of the Gila. I picked up a broken crystal of quartz in one of these piles. Leaving the "Cara," I

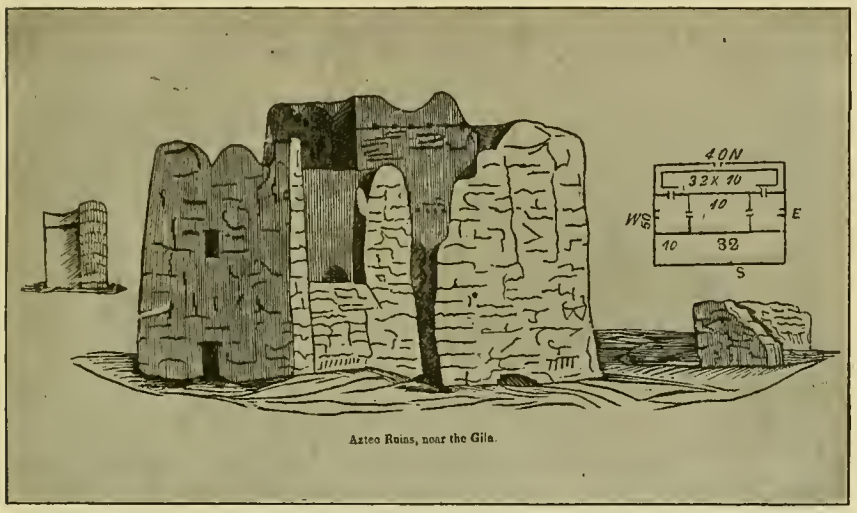


FIG. 5. Casa Grande in 1846 (Johnston).

turned toward the Pimos, and traveling at random over the plain, now covered with mesquite, the piles of earth and pottery showed for hours in every direction. I also found the remains of a sicia [acequia], which followed the range of houses for miles. . . . The general asked a Pimo who made the house I had seen. "It is the Cara de Montezuma," said he; "it was built by the son of the most beautiful woman who once dwelt in yon mountain; she was fair, and all the handsome men came to court her, but in vain; when they came, they paid tribute, and out of this small store she fed all people in times of famine, and it did not diminish; at last, as she lay asleep, a drop of rain fell upon her navel, and she became pregnant, and brought forth a boy, who was the builder of all these houses.

Shortly after the visit to Casa Grande of Lieutenant Colonel Emory, Lieutenant Colonel Cooke, in command of a battalion of Mormons, made his way to California via Tucson and the villages of the Pima, but there is little in his official report concerning the ruin. In 1848 Maj. L. P. Graham, of the dragoons, followed; although he must have passed near Casa Grande he says but little about it.

BARTLETT'S NARRATIVE

Six years after the advance guard of the "Army of the West" crossed southern Arizona the ruins were visited by members of the Mexican Boundary Survey, one of whom, John Russell Bartlett, was the author of an excellent account, accompanied with a sketch (fig. 6). Under date of July 12, 1852, Mr. Bartlett wrote of Casa Grande as follows:[1]

The "Casas Grandes," or Great Houses, consist of three buildings, all included within a space of 150 yards. The principal and larger one is in the best state of preservation, its four exterior walls and most of the inner ones remaining. A considerable portion of the upper part of the walls has crumbled away and fallen inwards, as appears from the great quantity of rubbish and disintegrated adobe which fills the first story of the building. Three stories now stand and can plainly be made out by the ends

FIG. 6. Casa Grande ruin in 1852 (Bartlett).

of the beams remaining in the walls, or by the cavities which they occupied; but I think there must have been another story above, in order to account for the crumbling walls and rubbish within. The central portion or tower rising from the foundation, is some 8 or 10 feet higher than the outer walls, and may have been several feet, probably one story, higher when the building was complete. The walls at the base are between 4 and 5 feet in thickness; their precise dimensions could not be ascertained, so much having crumbled away. The inside is perpendicular, while the exterior face tapers toward the top, in a curved line. These walls, as well as the division walls of the interior, are laid with large square blocks of mud, prepared for the purpose by pressing the material into large boxes about 2 feet in height and 4 feet long. When the mud became sufficiently hardened, the case was moved along and again filled, and so on until the whole edifice was completed. This is a rapid mode of building; but the Mexicans seem never to have applied it to any purpose but the

[1] Personal Narrative, etc., II, 272–277, New York, 1854. Cozzens' account, in his Marvellous Country, is practically a quotation from Bartlett here given. In the map of his "route" Casa Grande is located north instead of south of the Gila.

erection of fences or division walls. The material of this building is the mud of the valley, mixed with gravel. The mud is very adhesive, and when dried in the sun, is very durable. The outer surface of the wall appears to have been plastered roughly; but the inside, as well as the surface of all the inner walls, is hard finished. This is done with a composition of adobe, and is still as smooth as when first made, and has quite a polish. On one of the walls are rude figures, drawn with red lines, but no inscriptions. From the charred ends of the beams which remain in the walls, it is evident that the building was destroyed by fire. Some of the lintels which remain over the doors are formed of several sticks of wood, stripped of their bark, but showing no signs of a sharp instrument. The beams which supported the floors were from 4 to 5 inches in diameter, placed about the same distance apart and inserted deeply in the walls.

Most of the apartments are connected by doors, besides which there are circular openings in the upper part of the chambers to admit light and air. The ground plan of the building shows that all the apartments were long and narrow without windows. The inner rooms, I think, were used as store-rooms for corn; in fact, it is a question whether the whole may not have been built for a similar purpose. There are four entrances, one in the center of each side. The door on the western side is but 2 feet wide, and 7 or 8 high; the others 3 feet wide and 5 in height, tapering towards the top—a peculiarity belonging to the ancient edifices of Central America and Yucatan. With the exception of these doors, there are no exterior openings, except on the western side, where they are of a circular form. Over the doorway corresponding to the third story, on the western front, is an opening, where there was a window, which I think was square. In a line with this are two circular openings.

The southern front has fallen in in several places, and is much injured by large fissures, yearly becoming larger, so that the whole of it must fall ere long. The other three fronts are quite perfect. The walls at the base, and particularly at the corners, have crumbled away to the extent of 12 or 15 inches, and are only held together by their great thickness. The moisture here causes disintegration to take place more rapidly than in any other part of the building; and in a few years, when the walls have become more undermined, the whole structure must fall, and become a mere rounded heap, like many other shapeless mounds which are seen on the plain. A couple of days' labor spent in restoring the walls at the base with mud and gravel, would render this interesting monument as durable as brick, and enable it to last for centuries. How long it has been in this ruined state is not known; we only know that when visited by the missionaries a century ago it was in the same condition as at present.

The exterior dimensions of this building are 50 feet from north to south, and 40 from east to west. On the ground floor are five compartments. Those on the north and south sides extend the whole width of the building, and measure 32 by 10 feet. Between these are three smaller apartments, the central one being within the tower. All are open to the sky. There is no appearance of a stairway on any of the walls; whence it has been inferred that the means of ascent may have been outside.

On the south-west of the principal building is a second one in a state of ruin, with hardly enough of the walls remaining to trace its original form. . . . The central portion, judging from the height of the present walls, was two stories high; the outer wall, which can only be estimated from the débris, could not have been more than a single story.

Northeast of the main building is a third one, smaller than either of the others, but in such an utter state of decay that its original form can not be determined. It is small, and may have been no more than a watch tower. In every direction as far as the eye can reach, are seen heaps of ruined edifices, with no portions of their walls standing. To the north-west, about 200 yards distant, is a circular embankment from 80 to 100 yards in circumference, which is open in the center, and is probably the remains of

an inclosure for cattle. For miles around these in all directions, the plain is strewn with broken pottery and metates or corn-grinders. The pottery is red, white, lead-color, and black. The figures are usually geometrical and formed with taste, and in character are similar to the ornaments found on the pottery from the ruins on the Salinas and much farther north. Much of this pottery is painted on the inside, a peculiarity which does not belong to the modern pottery. In its texture too, it is far superior. I collected a quantity of these fragments, from which I selected the larger pieces.

HUGHES'S NARRATIVE

Casa Grande was thus described by Lieut. John T. Hughes[1] in his account of Doniphan's expedition in 1847:

After a march of 6 miles on the 10th of November, passing over plains which had once sustained a dense population, they came to an extensive ruin, one building of which, called the "Hall of Montezuma," is still in a tolerable state of preservation. This building was 50 feet long, 40 wide, and had been four stories high, but the floors and the roof had been burned out. The joists were made of round beams 4 feet in diameter [*sic*]. It had four entrances—north, east, south, and west. The walls were built of sun-dried brick, cemented with natural lime, which abounds in the adjacent country, and were 4 feet thick, having a curved inclination inwards toward the top, being smoothed outside and plastered inside. About 150 yards from this building to the northward is a terrace 100 yards long and 70 wide, elevated about 5 feet. Upon this is a pyramid, 8 feet high and 25 yards square at the top. From the top of this, which has no doubt been used as a watch-tower, the vast plains to the west and north-east, for more than 15 miles, lie in plain view. These lands had once been in cultivation, and the remains of a large acequia, or irrigating canal, could be distinctly traced along the range of dilapidated houses.

About the same day they came to the Pimo villages on the south side of the Gila. Captain Johnston observes: "Their answer to Carson when he went up and asked for provisions was, 'Bread is to eat, not to sell—take what you want.' The general asked a Pimo who made the house I had seen. 'It is the Casa de Montezuma,' said he, 'it was built by the son of a most beautiful woman, who once dwelt in yon mountain. She was fair, and all the handsome men came to court her; but in vain.—When they came they paid tribute and out of this small store she fed all people in times of famine, and it did not diminish.—At last as she lay asleep a drop of rain fell upon her navel, and she became pregnant and brought forth a son, who was the builder of all these houses.' "

LATER AMERICAN REPORTS

HINTON'S DESCRIPTION

The observations of a party of which Mr. Richard J. Hinton was a member, who visited Casa Grande on December 13, 1877, are thus recorded by him,[2] the description being accompanied with a full-page lithograph illustration of Casa Grande:

The Casa Grande itself is the remains of a large building, the walls of which are composed of a species of gray concrete or groat. They still stand in a crumbling and almost disjointed condition, for a height of from 30 to 45 feet, the inside wall being the highest. The exterior walls at their thickest part are 4 feet 6 inches thick. The interior walls at different points are well preserved, and show a uniform thickness of

[1] This account is taken largely from Capt. A. R. Johnston's narrative, given on pp. 64–65.

[2] Richard J. Hinton, Hand-book to Arizona.

nearly 4 feet. At the north-east corner there is a great rent, and the walls are entirely separated; the opening here is about 5 feet and occupies the whole of that angle. In the center of each side there are crumbled, out-of-shape openings, which on the north and west sides indicate old doors or entrances, but on the other sides appear to have resulted from the crumbling away of the walls. The interior shows a length of 52 feet north and south, and a width of 36 feet 6 inches east and west, while the exterior walls show in the same way a length of 61 by 45 feet 6 inches. Of course the exterior walls are much worn, furrowed and crumbled. In all probability they were originally not less than 6 feet thick. The interior walls still show above the débris traces of three stories, rows of small round holes indicating where the rafter poles had rested. In one room on the west side we were able to count them, and found 28 holes each side of the apartment, showing an average of 6 inches apart, with holes of 4½ inches diameter. The interior room or compartment is the best-preserved part of the structure. It is entered only on the east side and on the lower story as now visible, by a small window or aperture originally about 2 feet 4 inches wide, and about 4 feet 6 inches high, rather narrower at the top than at the base. This is the case with the other openings. There are six in all—two each on the interior walls to the north and south, one on the east wall, and one forming the entrance to middle rooms, with none at all on the west side. As to the exterior entrances, they appear to have been on the north and south fronts; those on the east and west being apertures broken by time and decay. There are several apertures in the interior walls, the purpose of which can not be ascertained. One is about 10 inches each way, though it is somewhat irregular in form; the other two would be about 7 inches each way. These apertures do not face each other, and consequently were not used to rest beams or rafters upon. The interior walls have been coated with some sort of cement or varnish which has a reddish-orange hue, and which at the present time can be peeled off by a penknife. There are a number of names scrawled on the inside walls, but none of special note. The accumulated débris almost forms a mound on the exterior, while inside the floor is very uneven. The interior room gives out a hollow sound. Outside the rains and winds are rapidly undermining the base of the walls; unless something be soon done to roof the structure and prop the walls, the Gila Casa Grande will be altogether a thing of the past.

BANDELIER'S ACCOUNT

Bandelier's account of Casa Grande is one of the most instructive of later descriptions. This explorer was the first, since Father Font, to give a ground plan of what is styled in the present report Compound A (Bandelier, p. 454) in which is represented the relation of the surrounding wall to the main structure. He gives likewise a plan of the mounds and platform of Compound B, before excavations, showing the two pyramids.

Bandelier's description is as follows:[1]

The walls of the Casa Grande are unusually thick, measuring 1.22 m. (4 feet), and even the partitions 0.92 m. (3 feet). At the Casa Blanca their thickness is only 0.50 m. (22 inches).

As already said, and in other ruins between Casa Grande and Florence, 0.92 and 0.60 m. (3 and 2 feet) were measured by me. . . .

The doorways are higher and wider than in northern ruins, so are the light and air holes. The roof and ceilings, as far as traceable, belong to the usual pueblo pattern,

[1] Final Report of Investigations among the Indians of the Southwestern United States, Part II; in *Papers of the Archæological Institute of America*, American Series, IV, Cambridge, 1892.

that is, they consist of round beams supporting smaller poles, on which rested a layer of earth. All the woodwork is destroyed except the ends of the beams, but I was informed that a few posts of cedar wood were still visible some years ago. Cedar only grows at some distance from Casa Grande, but this was no obstacle to the patient and obstinate Indian. I could not find any trace of stairways or ladders. It was remarked in the last century, that the Apaches were the destroyers of the woodwork in the building and something similar was told me; but to what extent this is true, I am unable to determine.

Of the other shapeless mounds surrounding the Great House, or composing the northern cluster of the ruins, I am not in a position to say anything except that they indicate two-story edifices, long and comparatively narrow. Their size without exception falls short of the dimensions of northern communal pueblos, and, notwithstanding the extensive area occupied by the ruins, the population can not have been large. I doubt whether it exceeded a thousand souls. Almost every inch of the ground is covered with bits of pottery, painted as well as plain, and I noticed some corrugated pieces. They all resemble the specimens excavated by Mr. Cushing from the vicinity of Tempe, and what I saw of those specimens convinces me that they belong to the class common to the ruins of Eastern and Central Arizona in general. There was among the potsherds which I picked up myself a sprinkling of pottery that closely resembled the modern ware of the Pimas and Papagos; but as I had already noticed the same kind on the Rio Verde, and had been forced to the conclusion that they were ancient, I am loath to consider them as modern at Casa Grande. Of other artificial objects, I saw broken metates, and heard of the usual stone implements. The culture, as indicated by such remains, offers nothing at all particular.

The profusion of pottery scattered far beyond the area covered by the buildings has caused the impression that the settlement was much larger than I have represented it to be; I have, however, no reason to modify my opinion. I have already stated that clusters of ruins are numerous about the Gila, and at no great distance apart. Intercourse between these settlements, if they were contemporaneously inhabited—of which there is as yet no proof—must have been frequent, and the winds and other agencies have contributed toward scattering potsherds over much larger expanses than those which they originally occupied. The acequias which run parallel to the Gila in this vicinity, and of which there are distinct traces, are usually lined with pieces of pottery which leads the untrained observer to draw erroneous impressions.

On the southwestern corner of the northern group of the Casa Grande cluster stands the elliptical tank which is indicated on plate 1, figure 59 [here pl. 5, "well"]. Its greatest depth is now 2½ meters (8¼ feet), and the width of the embankment surrounding it varies between 8 and 10 feet. A large mezquite tree has grown in the center of this artificial depression. As the tank stands on the southwestern extremity of the northern, and not 100 meters (300 feet) [*sic*] from the southern group, it was probably common to both.

Bandelier's references to the use of the "great houses" of the Gila are instructive. He writes (p. 460):

I have no doubt they may have been used incidentally for worship; still it was probably not their exclusive object. It should be remembered that we have in the first half of the seventeenth century descriptions of analogous buildings then actually used among some of the natives of Central Sonora. Those natives were the Southern Pimas, or "Nébomes," kindred to the Northern Pimas, who occupy the banks of the Gila near Casa Grande, Casa Blanca, and at intermediate points. Father Ribas, the historiographer of Sonora [1645], says that the villages of the Nébomes consisted of solid houses made of large adobes, and that each village had besides a larger edifice, stronger, and provided with loopholes which served, in case of attack, as a place of refuge or citadel. The purpose of this building was not merely surmised by Father Ribas,

who had means of acquiring personal knowledge, having been one of the early missionaries in Sonora. The Spaniards had an opportunity of experiencing its use to their own detriment, and the edifice was so strong that its inmates had to be driven from it by fire. Such a place of retreat, in case of attack, the Casa Grande and analogous constructions in Arizona seem to have been. The strength of the walls, the openings in them, their commanding position and height, favor the suggestion. That they may also have been inhabited is not impossible; Mr. Cushing's investigations seem to prove it.

After mentioning certain Pima traditions, Bandelier continues as follows:

The gist of these traditions is that the Pimas claim to be the lineal descendants of the Indians who built and inhabited the large houses and mounds on the Gila and Lower Salado Rivers, as well as on the delta between the two streams; that they recognize the Sonoran Pimas as their kindred, who separated from them many centuries ago; that they attribute the destruction and abandonment of the Casa Grande and other clusters now in ruins to various causes; and, lastly, that they claim the villages were not all contemporaneously inhabited. Further than that, I do not at present venture to draw conclusions from the traditions above reported; but enough is contained in them to justify the wish that those traditions may be collected and recorded at the earliest possible day, and in the most complete manner, in order that they may be critically sifted and made useful.

Regarding the kinship of the inhabitants of Casa Grande, Bandelier writes:[1]

Here the statements of the Pimas, which Mr. Walker has gathered, are of special value; and to him I owe the following details: The Pimas claim to have been created where they now reside, and after passing through a disastrous flood,—out of which only one man, Cĭ-hŏ, was saved—they grew and multiplied on the south bank of the Gila until one of their chiefs, Ci-vă-nŏ, built the Casa Grande. They call it to-day "Ci-vă-nŏ-qi" (house of Ci-vă-nŏ), also "Văt-qi" (ruin). A son of Ci-vă-no settled on Lower Salt River, and built the villages near Phoenix and Tempe. At the same time a tribe with which they were at war occupied the Rio Verde; to that tribe they ascribe the settlements whose ruins I have visited, and which they call "O-ŏt-gŏm-văt qi" (gravelly ruins). The Casa Blanca and all the ruins south of the Gila were the abodes of the forefathers of the Pimas, designated by them as "Vĭ-pĭ-sĕt" (great-grandparents), or "Ho-ho-qŏm" (the extinct ones). (Ci-vă-nŏ had 20 wives, etc. ["each of whom wore on her head, like a headdress, the peculiar half-hood, half-basket contrivance called Ki'-jo."—*Papers Archæol. Inst. Amer.*, IV, 463.]) At one time the Casa Grande was beset by enemies who came from the east in several bodies, and who compelled its abandonment; but the settlements at Zacaton, Casa Blanca, etc., still remained, and there is even a tale of an intertribal war between the Pimas of Zacaton and those of Casa Blanca after the ruin of Casa Grande. Finally, the pueblos fell one after the other, until the Pimas, driven from their homes, and moreover, decimated by a fearful plague, became reduced to a small tribe. A portion of them moved south into Sonora, where they still reside; but the main body remained on the site of their former prosperity. I asked particularly why they did not again build houses with solid walls like those of their ancestors. The reply was that they were too weak in numbers to attempt it, and had accustomed themselves to their present mode of living. But the construction of their winter houses—a regular pueblo roof bent to the ground over a central scaffold—their organization and arts—all bear testimony to the truth of their sad tale—that of a powerful sedentary tribe reduced to distress and decadence in architecture long before the advent of the Spaniards.

[1] In *Fifth Annual Report of the Archæological Institute of America*, 1883-84, pp. 80, 81, Cambridge, 1884.

In his Final Report Bandelier gives a figure or ground plan of the walled inclosure in which Casa Grande is situated, the only modern representation of the outside wall of Compound A with which the present writer is familiar. There is also an illustration of the two mounds of Compound B.

CUSHING'S RESEARCHES

Cosmos Mindeleff thus speaks of F. H. Cushing's researches relating to ruins similar to Casa Grande:[1]

In 1888 Mr. F. H. Cushing presented to the Congrès International des Américanistes[2] some "Preliminary notes" on his work as director of the Hemenway southwestern archeological expedition. Mr. Cushing did not describe the Casa Grande, but merely alluded to it as a surviving example of the temple, or principal structure, which occurred in conjunction with nearly all the settlements studied. As Mr. Cushing's work was devoted, however, to the investigation of remains analogous to, if not identical with, the Casa Grande, his report forms a valuable contribution to the literature of this subject, and although not everyone can accept the broad inferences and generalizations drawn by Mr. Cushing—of which he was able, unfortunately, to present only a mere statement—the report should be consulted by every student of southwestern archeology.

FEWKES'S DESCRIPTION

In 1892 the following description of Casa Grande by the present writer was published:[3]

A short distance south of the Gila River, on the stage route from Florence to Casa Grande station on the Southern Pacific Railroad, about 10 miles southwest of the former town, there is a ruin which from its unique character has attracted attention from the time the country was first visited. This venerable ruin, which is undoubtedly one of the best of its type in the United States, is of great interest as shedding light on the architecture of several of the ruined pueblos which are found in such numbers in the valleys of the Gila and Salt Rivers. The importance of its preservation from the hands of vandals and from decay led Mrs. Hemenway and others, of Boston, to petition Congress for an appropriation of money for this purpose. This petition was favorably acted upon, and an appropriation was made to carry out the suggestions of the petitioners.[4] . . .

As one approaches the ruin along the stage road from the side toward Florence,[5] he is impressed with the solidity and massive character of the walls, and the great simplicity of the structure architecturally considered. Externally, as seen from a distance, there is much to remind one of the ruins of an old mission, but this resemblance is lost on a closer examination. The fact that the walls of the middle (central) cham-

[1] In *13th Ann. Rep. Bur. Ethnol.*, p. 297.

[2] Berlin meeting, 1888; *Compte-Rendu*, Berlin, 1890, p. 150 et seq.

[3] In *Journal of American Ethnology and Archæology*, II, Boston and New York, 1892.

[4] The repairs and other work carried on by means of this appropriation have been described at length by Mr. Cosmos Mindeleff (in *13th Ann. Rep. Bur. Ethnol.*).

Later a corrugated iron roof was erected over Casa Grande to protect it from the elements. This feature detracts somewhat from the picturesqueness of the ruin, but is necessary for the preservation of the standing walls. The bases of the walls, undermined and about to fall in several places, have been strengthened with cement and with iron rods strung from wall to wall. This roof was repainted in 1907 out of the appropriation for the repair of the building.

[5] The writer visited the ruin from this side, but one coming from the Eastern States would probably find it more convenient to make the station of Casa Grande on the Southern Pacific the point of departure.

ber rise somewhat above those of the peripheral is evident from a distance, long before one approaches the ruin. This architectural feature imparts a certain pyramidal outline to the pile, rendering it somewhat difficult to make out the relationship of the different parts. The departure of the outer face of the external walls from a vertical line, which deviation is probably due in part at least, possibly wholly, to atmospheric erosion and natural destruction, the falling in of the material of which the upper courses are made, is a marked feature of the vertical lines of the external walls on all sides. [Fig. 7.] The débris within the chambers on the present floor [1] is evidently in part

FIG. 7. Casa Grande ruin, from the south.

the result of the falling in of roofs and floors of upper stories, but no large fragments indicating the character or position of such in place could be found.

The orientation of the ruin corresponds to the cardinal points. From my want of instruments of precision, I was not able to determine its true position or to state accurately the exact orientation of the ground plan; but by means of a pocket compass, it

[1] Several persons have told me that it was but a few years ago when wooden beams and lintels were to be seen *in situ* in the building. These informants have also told me that within a short time the walls were much better preserved than at present. As far as I have examined the ruin, not a fragment of wood still remains, although the holes from which the *vigas* [beams] have been taken can still be readily seen in several places.

was seen that the variation of the bounding walls from north-south, east-west lines was not very great. It seems evident that it was the intention of the builders to align the walls with the cardinal points.

It may be convenient to consider the chambers of the ruin as if seen by a bird's-eye view, without reference to the different stories which were once found in the building, and gave its elevation. Practically, at present, indications only of these stories remain.

The plan [see pl. 6] given at the close of this article shows the general arrangement of the rooms, and may be of use in understanding the description of the separate chambers which follows. Examining this plan, it will be seen that the bounding walls of the ruin inclose five chambers which fall in two groups: Twin chambers, one at either end, and triplets in the interval between them. The rooms from their position may very conveniently be designated, from the side of the ruin in which they are: The north, south, east, west, and central chambers. The north and south are alike, and extend wholly across their respective sides of the ruin, so that their east and west walls are portions of the eastern and western external walls of the building. With the east and west chambers, however, it is somewhat different. Whereas three of the walls of the north and south chambers are external walls of the building wholly or in part, there is but a single wall of either the east or west rooms which is external. None of the walls of the remaining member of this triplet, the central chamber, excepting possibly those belonging to upper stories, are external. All the chambers of both kinds have a rectangular form, and their angles are as a general thing carefully constructed right angles. The vertical and horizontal lines are seldom perfectly straight, although much truer than is ordinarily the case in more northern ruins. [Fig. 8.]

Let us take up for consideration the different chambers which have been mentioned, in order to call to mind any special features in their individual architecture.

North Room (A)

This room occupies the whole northern end of the ruin, and has all the bounding walls of the lower stories entire, with the exception of the northeast corner and a small section of the adjacent northern wall. As one approaches the ruin from the side toward Florence, it is through this broken-down entrance on the northeast corner that one enters Casa Grande. Although, as will be seen presently, there are several other entrances to the ruin, this passageway is in fact the only means of entrance into the chamber.

The greatest length of the room is from the eastern to the western wall. There are good evidences in this room of at least two stories above the present level of the ground which now forms the floor of the chamber.[1] As the floors are destroyed these former stories now form one room with high bounding walls. On the northern side in the second story of this chamber, there is an artificial break in the wall which indicates that there had once been a passageway. The walls of this opening are not perpendicular, but slightly inclined, so that their upper ends slightly approach. The eastern wall of this passageway is now cracked, and will probably fall in a short time. The position of the lintel is well marked, but the lintel itself, which was probably of wood, has been removed from its former place, and cavities alone remain, plainly showing, however, its former size at the two upper corners of the opening. A groove on the inner side of the northern wall, which marks the lines of the flooring of an upper chamber, is well shown, although broken and gapped in many places. Near the

[1] It would not be possible to demonstrate how many stories Casa Grande formerly had without excavations. Even if the lower floor should be laid bare, there would always remain the difficulty in the determination of how many upper stories have been destroyed by the weathering of the walls. I think that it is not difficult to find evidences of four stories at certain points. The observations which I could make on the present condition of the ruin do not justify my acceptance of the theory that there were more. There is good evidence that there were three stories.

western end of the northern wall, not far from the corner, there is an opening just above the line of the second floor. The line of insertion of a possible third floor can be easily traced above the northern passageway. . . .

The western wall of the room is pierced by a single circular and a rectangular window, situated in the same story as the northern passageway above mentioned, about on a level with the top of the door or opening on the northern side. [Fig. 9.] This single opening lies midway between the northwestern and southwestern corners of the room.

FIG. 8. Interior of room, showing doorway and lines of floor.

The southern wall of the north room (A) shows certain architectural details in construction which are characteristic. Two openings lead from the chamber A into adjoining rooms. One of these opens into the eastern chamber D; the other into the western, B. There is no passageway from room A into the middle chamber, C, but through the wall into chamber B is a broad opening through that portion of the wall which forms the second story. This is undoubtedly artificial, as the sides of it are smooth and resemble similar jambs in doorways and windows of inhabited pueblos. Their surface wall is smooth, and they are nearly vertical. Below this opening the

chamber wall is more or less broken and enlarged, its edges are rough, and in them are rounded cavities. It is next to impossible now to say whether the opening is the result of an enlargement of a previously existing doorway, or simply the result of a breaking away of the wall. The upper portion of the doorway on the second story is broken and destroyed. A passageway from A into the east room, D, situated in the second story, is very conspicuous. Its sides slope slightly, one side being more out of perpendicular than the other. The width of the opening is thus greater at the base.

Between the openings from the north room into chambers B and D, the floor groove

FIG. 9. Interior of north room, looking west.

of the second story can be easily traced, and well preserved impressions of the ends of the small sticks which were probably placed above the beams can be readily seen. In several instances it was possible to pick out of the adobe a few small fragments of woody remnants of the ends of the small sticks which formerly filled these holes, but as a rule these fragments are very small. The impressions in the adobe, however, where rods formerly existed are as well shown as if the sticks or reeds had been extracted but a few weeks ago.

While room A is by no means the best preserved of the five chambers which compose Casa Grande, its walls are still in a fair condition for study. There are but few van-

dalistic markings upon it, and aside from the fact that the northeast corner is broken down, the walls are in tolerably good condition. Possibly the thing most to be regretted in the recent mutilations of this part of the ruin is an attempt by some one to discover by excavation how far the foundations extend below the surface of the ground by undermining the northwest corner of the ruin on the outside. This excavation reveals the amount of weathering of the wall at the surface of the ground, but it has been left in such a condition that it weakens the whole corner of the building, for it affords an all too good opportunity for additional undermining by the atmosphere, rains, and like agents of erosion.

Room B, West Room

This chamber, which belongs to the middle triplet of rooms, being the most western member of the three, like its two companions has a rectangular shape, its longest dimension being from north to south. It has an external entrance on the west side, and there are indications of former artificial passageways into chambers A and E. There is an opening into the central chamber C, but no passable way through. The opening through the wall into room A, as seen from that room, has already been mentioned. On this side it is very much broken in the first story, but on the second, the upright walls of the former passageway are smooth and little broken, except in the upper part, near where the lintel formerly was. The wall of the chamber on the north side, above the former passageway, is more or less broken and looks as if it would tumble in at no distant date.

The eastern wall of chamber B is higher than the western, making the additional story, which forms the western wall of a central chamber. While there is no passageway into the central chamber C large enough to enter from this side, there are two openings, one above the other, in the wall. The lower of these is rectangular in shape, with the larger dimension horizontal; the upper is elongated, rectangular, with the side vertical. The size of rooms B, C, and D is about the same, 24 feet long by a little over 9 broad.

The single opening from chamber B into the south room E appears to be the enlargement of two passageways, one on the first, the other on the second story. The former is almost wholly clogged up by fallen débris strewn over the floor of the chamber. A portion of the wall above the latter has fallen into the opening so neatly that it would seem to have been placed there. The upper part of the west chamber on the south side is very much broken, and traces of the upper story which probably once existed are difficult to discover.

Room D, East Room

The chamber on the east of the ruin, like its fellow B on the west, is elongated in a north-south direction, and plainly shows at least two stories above the present level. One can enter this room from the side, and from it one can readily pass into the central chamber C. It seems in keeping with what is known of ceremonial inclosures used by Indians at certain times, that if the central room was a sacred chamber or used for religious ceremonials, it very properly had an entrance from the eastern room and not from the others. [Fig. 10.]

The exterior entrance to room D is enlarged by the breaking of the walls, and affords evidence that it was one of the principal entrances into the building. It opens into the chamber about midway in its length and shows well-defined lintel marks. On the second story the walls are more or less broken on the eastern side, both externally and internally. A generous passageway from the second story of room D into room A occupies about a fourth part of the width of the north wall. The wall is intact with this exception, and the position of the flooring of the chamber above the surface of the ground can be readily seen. The "floor groove" of the second story is pronounced, that on the east wall being a little lower than that on the west. The

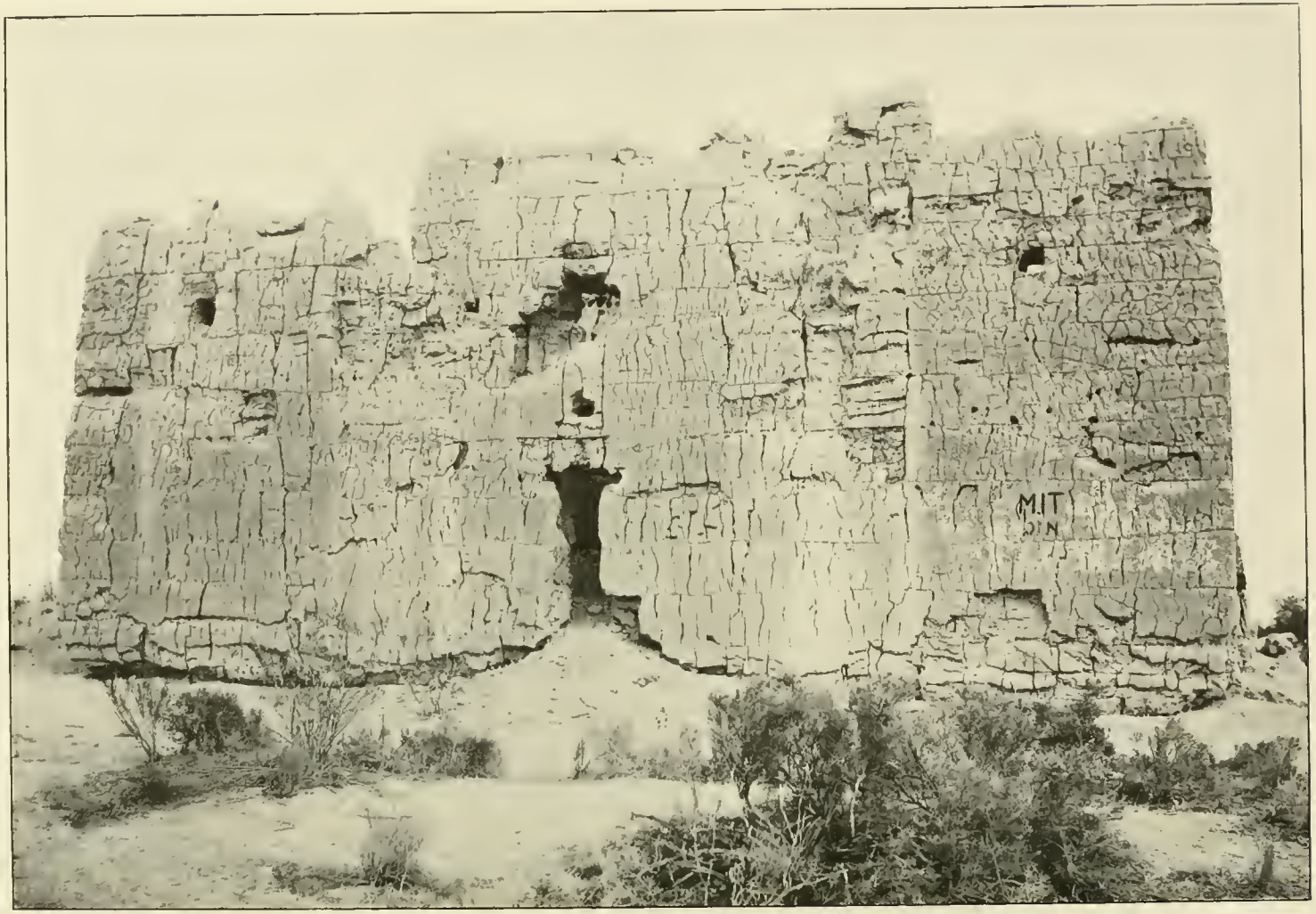
south wall of the first story of room D is intact; an opening which would seem to indicate the position of the passageway into the south room has its vertical jambs still well preserved, but its top has fallen and is very much broken.

Room E, South Room

The south chamber of the ruin, like the north, extends across the whole end of the ruin. Its greatest length is thus east and west. Its northern wall forms the southern side of the east, west, and central chambers B, D, and C, just as the southern

Fig. 10. Casa Grande ruin, looking northwest.

wall of the northern chamber A separates this room from the same members of the middle series. As with its northern fellow, there are openings into the lateral chambers B and D, the western and eastern rooms, but no signs of the existence of an entrance at any time into the central chamber C. The southeastern angle of room E, which is at the same time the southeastern corner of the ruin, is broken down so that a gap is formed, by which alone one can enter the room. Possibly this opening is not wholly the product of natural destruction. Two great gaps break the continuity of the southern wall, but the southwest corner of the chamber is entire from the ground to a considerable height.



(From Mindeleff)

WEST WALL OF CASA GRANDE, SHOWING COMPONENT BLOCKS

The supposed former passageways into chambers B and D have already been described in my consideration of these rooms. When seen from the south room they do not materially differ from what has already been said of them. The western wall of room E is pierced by a small, square, windowlike opening high up in the second story. Upon this side of the room one can without difficulty make out two stories and the remnants of the third above the present level of the ground. The line of holes in which the floor logs formerly fitted can be traced with ease, and a row of smaller cavities can be readily seen between the passageway into room B and a middle vertical line of the north wall. Vandalistic scribblings of varied nature deface this room, and ambitious visitors with no claim for complimentary notice have cut their names upon the smoothly plastered walls. There are also spiral markings resembling forms of pictographs common on the sides of the mesas inhabited by the Tusayan Indians.

Room C, Central Room

The central chamber of Casa Grande, like the other rooms, the eastern and the western, is elongated in a north-south direction. It differs from the others in that it shows the walls of an additional story on all four sides, and has but one entrance. This entrance is from its eastern side. The walls are very smooth and apparently carefully polished. There are well preserved evidences of the flooring, and the smaller sticks which formerly lay upon the same are beautifully indicated by rows of small holes in the northern wall. The eastern opening by which one enters has already been described, as well as the windowlike openings leading into the western chamber.

The walls of the third story on the western side are pierced by three circular openings about 5 inches in diameter, which preserve their ancient outline. The rim of these openings is smoothly polished, which would indicate that they were never used for floor joists; indeed, their position seems to point in the same direction. They were possibly windows or lookouts. On the north and south wall there are similar openings, one on each wall. The round hole in the south wall is situated about on the middle vertical line of the wall, while that on the north is a little to the east of the middle. On the east wall there are three of these small round holes, placed one to the north of the doorway and one to the south. These openings are at times placed as high as the head of a person standing on the floor of the third chamber, but there are some which are only a few feet above the probable level of the floor. They appear to be characteristic of the central room and of the third story.

COSMOS MINDELEFF'S DESCRIPTION

The most comprehensive description of Casa Grande is by Mr. Cosmos Mindeleff. (Pls. 8–10.) As this is available to all who have access to the reports of the Bureau of American Ethnology, it is not here quoted in its entirety, but reference is made to certain points, some of which were first brought out by this talented author.

The name Casa Grande has been usually applied to a single structure standing near the southwestern corner of a large area covered by mounds and other débris, but some writers have applied the term to the southwestern portion of Compound A, while still others have so designated the whole area. The last-mentioned seems the proper application of the term, but throughout this paper, in order to avoid confusion, the settlement as a whole will be designated the Casa

Grande Group, and the single structure, with standing walls, the Casa Grande ruin, or simply Casa Grande.

Probably no two investigators would assign the same limits to the area covered by the group, as the margins of this area merge imperceptibly into the surrounding country.

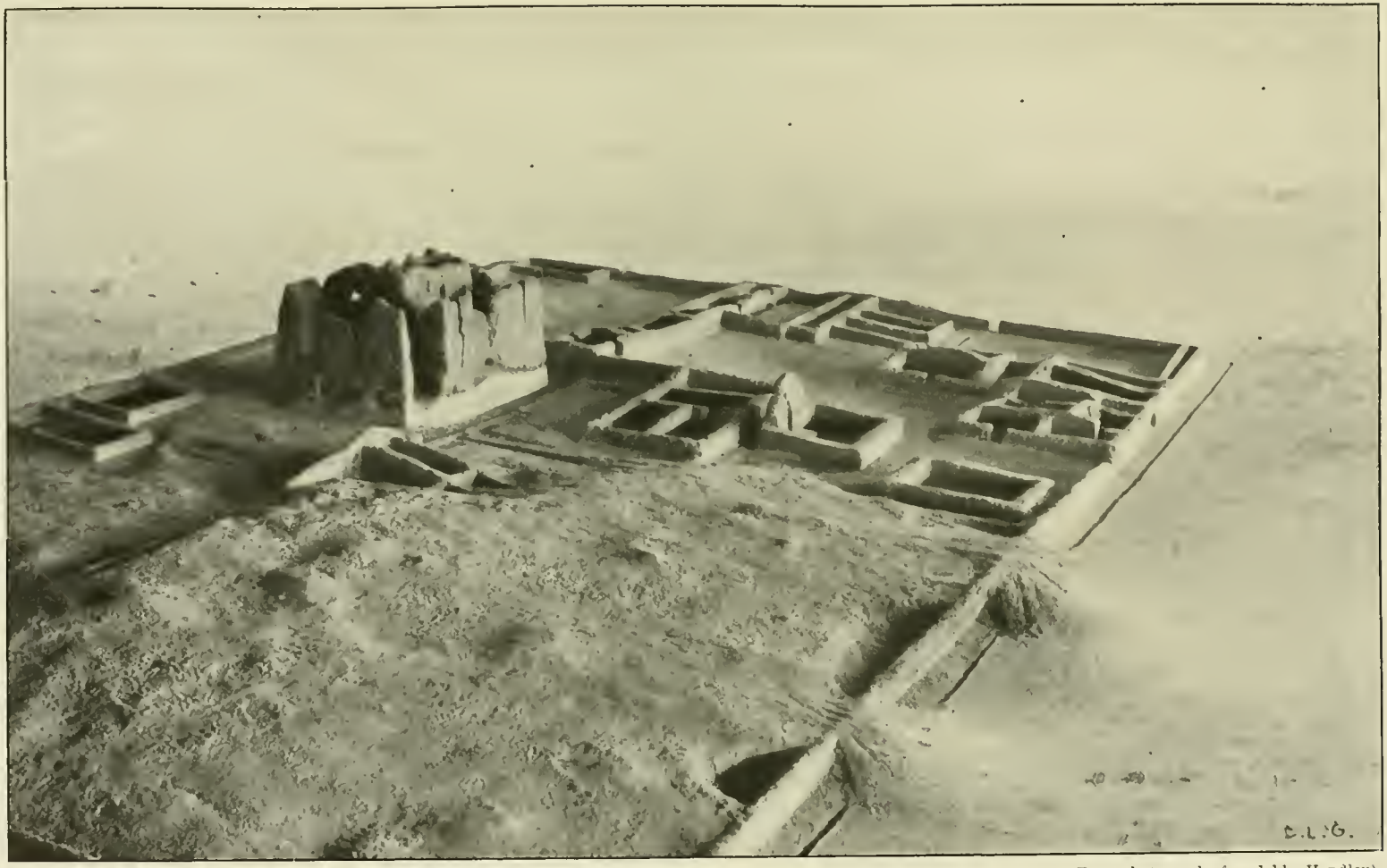
The bird's-eye views here used (pls. 11, 12) to illustrate the relation of Casa Grande to the surrounding mounds are in general correct, although not entirely in agreement with the results of the excavations. According to Mindeleff, the area covered by the Casa Grande Group "extends about 1,800 feet north and south and 1,500 feet east and west, or a total area of about 65 acres."

The following description of Casa Grande is from Mindeleff :[1]

The Casa Grande ruin is often referred to as an adobe structure. Adobe construction, if we limit the word to its proper meaning, consists of the use of molded brick, dried in the sun but not baked. Adobe, as thus defined, is very largely used throughout the Southwest, more than 9 out of 10 houses erected by the Mexican population and many of those erected by the Pueblo Indians being so constructed; but, in the experience of the writer, it is never found in the older ruins, although seen to a limited extent in ruins known to belong to a period subsequent to the Spanish conquest. Its discovery, therefore, in the Casa Grande would be important; but no trace of it can be found. The walls are composed of huge blocks of earth, 3 to 5 feet long, 2 feet high, and 3 to 4 feet thick. These blocks were not molded and placed in situ, but were manufactured in place. The method adopted was probably the erection of a framework of canes or light poles, woven with reeds or grass, forming two parallel surfaces or planes, some 3 or 4 feet apart and about 5 feet long. Into this open box or trough was rammed clayey earth obtained from the immediate vicinity and mixed with water to a heavy paste. When the mass was sufficiently dry, the framework was moved along the wall and the operation repeated. This is the typical pisé or rammed-earth construction, and in the hands of skilled workmen it suffices for the construction of quite elaborate buildings. As here used, however, the appliances were rude and the workmen unskilled. An inspection of the illustrations herewith, especially of Plate LV [here pl. 10], showing the western wall of the ruin, will indicate clearly how this work was done. The horizontal lines, marking what may be called courses, are very well defined, and, while the vertical joints are not apparent in the illustration, a close inspection of the wall itself shows them. It will be noticed that the builders were unable to keep straight courses, and that occasional thin courses were put in to bring the wall up to a general level. This is even more noticeable in other parts of the ruin. It is probable that as the walls rose the exterior surface was smoothed with the hand or with some suitable implement, but it was not carefully finished like the interior, nor was it treated like the latter with a specially prepared material. . . . The floors of the rooms, which were also the roofs of the rooms below, were of the ordinary pueblo type, employed also to-day by the American and Mexican population of this region. . . . Over the primary series of joists was placed a layer of light poles, 1½ to 2 inches in diameter, and over these reeds and coarse grass were spread. The prints of the light poles can still be seen on the walls. . . .

The walls of the northern room are fairly well preserved, except in the northeastern corner, which has fallen. The principal floor beams were of necessity laid north and south, across the shorter axis of the room, while the secondary series of poles, 1½ inches in diameter, have left their impression in the eastern and western walls.

[1] In *13th Ann. Rep. Bur. Ethnol.*, p. 309



(From photograph of model by Hendley)

BIRD'S-EYE VIEW OF NORTH HALF OF COMPOUND A

(From photograph of model by Hendley)

BIRD'S-EYE VIEW OF COMPOUND A, FROM THE SOUTH

There is no setback in the northern wall at the first floor level, though there is a very slight one in the southern wall; none appears in the eastern and western walls. Yet in the second roof level there is a double setback of 9 and 5 inches in the western wall, and the northern wall has a setback of 9 inches, and the top of the wall still shows the position of nearly all the roof timbers. This suggests—and the suggestion is supported by other facts to be mentioned later—that the northern room was added after the completion of the rest of the edifice.

The second roof or third floor level, the present top of the wall, has a decided pitch outward, amounting to nearly 5 inches. Furthermore, the outside of the northern wall of the middle room, above the second roof level of the northern room is very much eroded. This indicates that the northern room never had a greater height than two stories, but probably the walls were crowned with low parapets. . . . The walls of the western room were smoothly finished and the finish is well preserved, but here, as in the northern room, the exterior wall of the middle room was not finished above the second roof level, and there is no doubt that two stories above the ground were the maximum height of the western rooms, excluding the parapet. . . .

The walls of the southern room are perhaps better finished and less well constructed than any others in the building. The beam holes in the southern wall are regular, those in the northern wall less so. The beams used averaged a little smaller than those in the other rooms, and there is no trace whatever in the overhanging wall of the use of rushes or canes in the construction of the roof above. The walls depart considerably from vertical plane surfaces; the southern wall inclines fully 12 inches inward, while in the northeastern corner the side of a doorway projects fully 3 inches into the room. . . . The walls of the eastern room were well finished, and, except the western wall, in fairly good preservation. The floor beams were not placed in a straight line, but rise slightly near the middle, as noted above. The finish of some of the openings suggests that the floor was but 3 or 4 inches above the beams, and that the roughened surface, already mentioned, was not part of it. . . .

Openings.—The Casa Grande was well provided with doorways and other openings arranged in pairs one above the other. There were doorways from each room into each adjoining room, except that the middle room was entered only from the east. Some of the openings were not used and were closed with blocks of solid masonry built into them long prior to the final abandonment of the ruin.

The middle room had three doorways, one above the other, all opening eastward. The lowest doorway opened directly on the floor level, and was 2 feet wide, with vertical sides. . . . The doorway of the second story is preserved only on the northern side. Its bottom, still easily distinguishable, is 1 foot 6 inches above the bottom of the floor beams. It was not over 2 feet wide and was about 4 feet high. . . . In addition to its three doorways, all in the eastern wall, the middle tier of rooms was well provided with niches and holes in the walls, some of them doubtless utilized as outlooks. On the left of the upper doorway are two holes, a foot apart, about 4 inches in diameter, and smoothly finished. Almost directly above these some 3 feet, and about 2 feet higher than the top of the door, there are two similar holes. Near the southern end of the room in the same wall there is another round opening a trifle larger and about 4½ feet above the floor level. In the western wall there are two similar openings, and there is one each in the northern and southern walls. . . . In the second story, or middle room of the middle tier, there were no openings except the doorway in the eastern wall and two small orifices in the western wall.

PRESENT CONDITION

Main Building

The following description of the Casa Grande ruin (pls. 8–10) contains new facts derived from the author's observations and excavations made in the winters of 1906–7 and 1907–8:

CONSTRUCTION

The walls of Casa Grande are of a fawn color slightly tinged with red. Externally they are rough and very much eroded, but the interior walls are plastered, still showing places that formerly, in the words of Father Kino, were as smooth as "Puebla pottery."

The walls are constructed of a natural cement, commonly called *caliche* by the Mexicans, composed of lime, earth, and pebbles; this was made into blocks, which were laid in courses. These blocks are supposed to have been made in position, the materials therefor being rammed into bottomless baskets or wooden frames, that were raised as the work progressed, until the wall reached the desired height. The blocks are not of uniform size, consequently the horizontal joints of the courses are not always the same distance apart. Although clearly shown in the outside walls, these joints are not visible in the interior walls on account of the plastering.

The exterior faces of the walls are not perfectly plumb, the thickness of the walls at the top being much less than at the base. Impressions of human hands appear in places in the plaster of the north and the west room. Posts were used to support some of the narrow walls, and stones employed for the same purpose are found in their foundations.

ROOMS

The ground plan of the main building shows that its walls form five inclosures, which may be termed the north, west, south, east, and central rooms. When the walls had reached the height of about 7 feet, these inclosures were filled solid with earth, the upper surface forming the floors of the rooms of the first story. In the north, west, south, and east inclosures there were two rooms above each ground room; the central room had three stories, being one story higher than the rooms which surrounded it.[1]

[1] Many conflicting statements regarding the former height of Casa Grande are on record, most authors favoring three or four stories. There were undoubtedly four stories counting from the level of the plain to the top of the highest wall, as could be seen from the outside as one approached the structure, but the lowest story was filled solid with earth, so that inside the building there were really only three tiers of rooms, one above the other in the central part of the ruin and two on each of the four sides. The entrance into the lowest room was on a level with the roofs of the surrounding buildings, forming a terrace that surrounded the base of Casa Grande. Entrance to the upper rooms was effected by means of ladders from the outside and by hatchways. The positions of the outside doorways indicate that there were entrances on all four sides, but the middle room had only one doorway, which was situated on the east side.

WALLS

The interior walls of the north rooms in both stories are well preserved except in the southeast corner (fig. 11), where there was probably a connection with six rooms which extended to the north wall of the inclosure. As indicated by a series of holes in the eastern and western walls, the floor beams extended north and south. The posi-

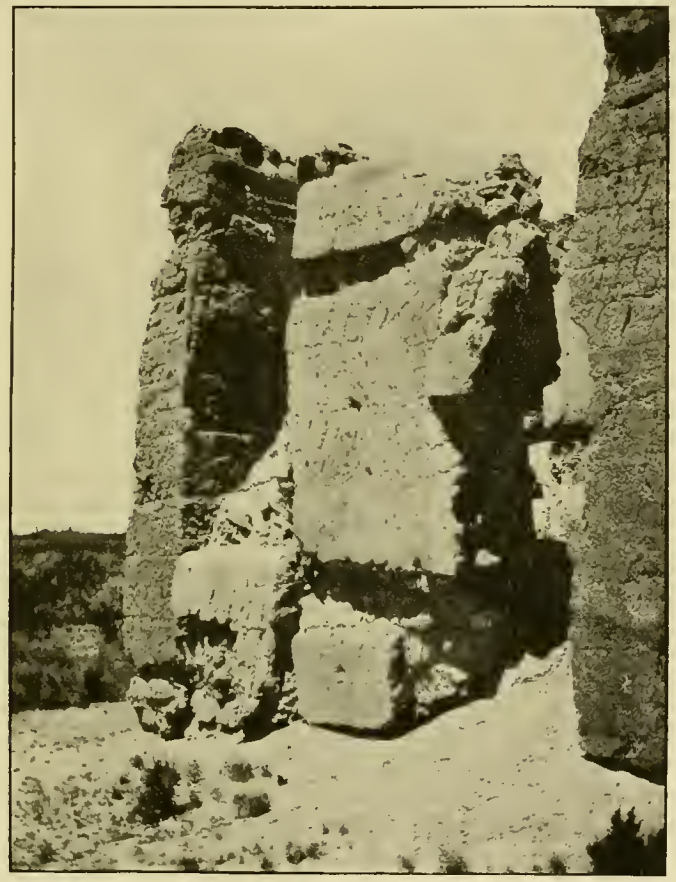


FIG. 11. Southeast corner of ruin, showing part of east wall.

tion of the floors is also indicated by ledges, or setbacks, one of the best of which appears on the level of the roof in the north wall of the first story; there is also a narrow ledge on the south wall. The east and west walls in both stories are true to the perpendicular from base to top. The tops of the north and west walls of the second story show setbacks, and the apertures where the beams were inserted are clearly marked. Small holes indicating that rushes were used

in the construction of the roof are well marked in the east and west walls of the second story. The outer face of the north wall is much eroded near the top, exhibiting no evidences of continuation into a third story. There was a low parapet rising slightly above the roof on the north, as well as on the east and west walls of the north room. Both lower and upper stories of the west room have smooth walls, but the exterior surface of the walls of the central room, above the line of the second floor, is rough, indicating that the western inclosure never had more than two stories. The east wall of the west room is slightly curved, while the west wall of the same room is straight. Rows of holes in the east wall, which formerly received the floor beams, are arranged somewhat irregularly. The inner faces of the walls of the south room are finely finished, particularly on the south side, although the wall itself is in places more broken than the north or west walls. The holes for beams in the south wall are less regular in arrangement than those in the north wall.

A fragment of the east wall of the south room remained standing up to within a few years, when the repairs were made by contractors. At one time the south room was excavated far below its original floor, as indicated by the line of erosion on the surface of the north wall and a corresponding line on the opposite side walls. There were formerly two doors, one above the other, in the south wall, but the lintel between them has disappeared, the south wall remaining in the form of two very unsteady sections. The interior walls of the east room are finely finished, while the exterior surface of the east wall of the central room is very much eroded. The exterior surface of the east wall of the central section shows the effects of exposure to the weather, suggesting that there were but two stories to the eastern part. The north wall of the central rooms runs through the east wall, without bonding, suggesting later construction of the latter. A wide crack left in the east wall where the north wall joins is smoothly plastered over for part of its length, a condition which implies earlier construction. The inner walls of the central rooms are smooth; the marks of reeds, grasses, and rafters indicate the former existence of floors in this part of the building. The roughness of the plaster above the line of the floor of the second story indicates that there was once a low banquette about the room. The row of holes that accommodated the beams of the roof of the third story is not flush with the top of the wall but somewhat below it, indicating that the walls there were formerly continued into a low parapet.

FLOORS

The floors of the second and third stories served as ceilings of the first and second stories, respectively, and resemble those of the ordinary adobe houses of the Southwest. The beams were small cedar

logs, most of which were laid across the width of the room, their extremities being inserted for support in the walls, or in some instances laid on a ledge or in a recess. The rows of holes that accommodated the ends of the beams are to be seen in most of the rooms; some of these holes are not strictly in line. Each roof was covered with mud firmly packed down and hardened by exposure to the air and to the constant pressure of human feet; in places appear the prints of reeds and grasses which were formerly laid on the rafters. Many Americans have told the writer that when they first saw Casa Grande the ends of burnt timbers protruded from the walls. Logs were found in several rooms, some of which were charred, while others had been untouched by fire.

DOORWAYS AND WINDOWS

The external entrances into most of the rooms of each story of Casa Grande were lateral, and there is reason to suppose that the rooms in which no openings appear in the side walls were entered by hatchways. As the floors have all disappeared, it is impossible, of course, to know what or where the entrances to rooms from the roof were. In the lowest story was a doorway about midway in each side. Openings appear in about the corresponding positions in the stories above, except the third, where the only entrance to be seen is on the east side. As its threshold was on a level with the roof of the second story, this doorway probably opened on the roof of the east rooms in that story. In addition to these external openings there were passageways between the north, south, east, and west rooms, in the first and second stories.

The doorway of the middle room in the first story was on the east side.

All the doorways were constructed on the same pattern. They averaged about 2 feet in width, and some were slightly narrower at the top than below. This decrease in width may be a survival of the times when the conical, or beehive, form of architecture prevailed.

The masonry over the doorways is now, as a rule, more or less broken, but it still shows holes for the insertion of logs that formed the lintels, which were arranged in series one above another. While most of the lintels which supported the adobe have been wrenched out, some remain, holding in place the heavy material of which this part of the wall was built.

The doorway between the west and the south room has been closed with large solid blocks of masonry.

The sills of most of the doorways are broken, but the jambs are entire and smoothly plastered.

There are several round apertures in the walls that may have served for lookouts. In the east wall of the central room to the left of the upper doorway are two such openings, each about 4 inches in diameter, and near the south end of this room in the east wall is another. Two similar apertures are found in the west wall of the inner room, one in the upper story of the north wall, and another in the south wall.

Cosmos Mindeleff makes the following statement:[1]

> The frequency of openings in the upper or third story and their absence on lower levels, except the specially arranged openings described later, supports the hypothesis that none of the rooms except the middle one were ever more than two stories high and that the wall remains above the second roof level represent a low parapet.

CASA GRANDE MOUNDS

General Description

It is evident to anyone who visits Casa Grande that the historic structure called by this name is only one of many blocks of buildings which formerly existed in the immediate vicinity. While it is now difficult to determine whether all these structures were contemporaneously occupied, it is evident that the Casa Grande Group, in its prime, was no mean settlement. Evidences of former habitations cover much of the surface of the reservation[2] and extend on all sides far beyond its boundaries. The limits of this prehistoric settlement are difficult to determine. The whole plain was dotted at intervals with houses similar to those of Casa Grande, from the point where the Gila leaves the mountains to its junction with its largest tributary, the Salt, the valley of which is also marked by the remains of many similar prehistoric buildings. Not all the mounds on the Casa Grande Reservation, however, contain ruins of great buildings; many walled structures, formerly homes of the inhabitants, have fallen, leaving but slight traces of their existence—no vestiges of walls above the surface of the ground, merely broken metates or fragments of pottery scattered over a limited area. This destruction was inevitable, owing to the fragile character of the wattled walls. Even the foundations of heavier walls of many of the buildings are buried in the débris from the upper courses.

Two types of mounds occur in the Casa Grande Group: (1) Those containing walls of houses and (2) those consisting entirely of earth and débris not including buried walls. The former are composed of

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[1] *13th Ann. Rep. Bur. Ethnol.*, p. 314.

[2] As is well known, this reservation, through the efforts of many public-spirited men and women, has been placed under the supervision of a resident custodian. The present custodian is Mr. Frank Pinckley.

earth or clay, which has fallen from the walls, burying the foundations, augmented by sand blown by the winds. Mounds of the second class are composed solely of débris; when opened, some of these show stratification, as if formed of mud or soil deposited artificially on them from time to time in clearing out reservoirs or making other excavations, while others contain ashes and fragments of pottery scattered through the soil from the surface to a considerable depth. Certain of these mounds are devoid of features suggesting artificial origin.

Mounds of the first class admit of still further classification into two kinds: (*a*) Those arranged in clusters, each resting on a platform, bounded by a surrounding wall—these are remains of compounds; (*b*) compact blocks of rooms, each without a surrounding wall, known as clan-houses. While the name Casa Grande is here applied to the main building of one compound (A), the designation Casa Grande Group of mounds includes all the clusters of adjacent mounds situated on the reservation. For many years the main building and a few outlying walls (fig. 12) were the only structures projecting above the surface, but now it is known that the historic Casa Grande is but one of many aboriginal buildings in this neighborhood. Excavations have established the fact that many mounds of the Casa Grande Group are remains of former houses, and that there are as many others composed of the débris of former habitations.

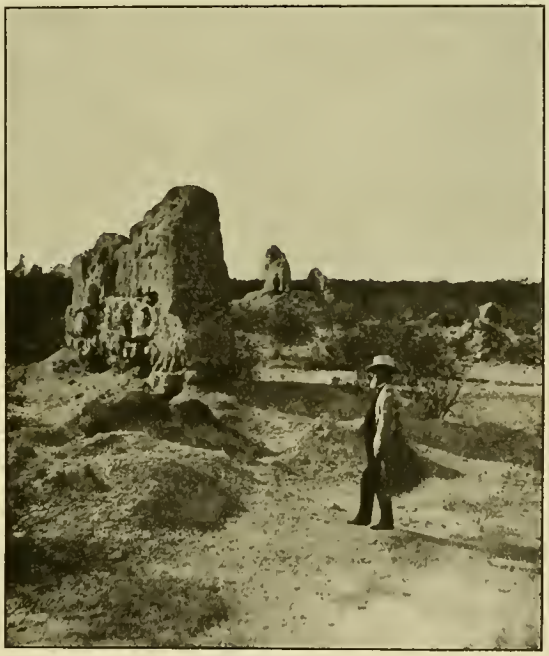

FIG. 12. West wall of Font's room (about 1880).

For convenience of study and reference the large walled inclosures constituting the first class of mounds, called compounds, are designated A, B, C, D, and E. These will be considered in order.

Compound A

Compound A (pls. 7, 11, 12) is not only the largest [1] of the Casa Grande compounds, but is also the most important, containing as it does the historic ruin and a few other walls of rooms standing above ground when excavations began. The following description is quoted from the writer's preliminary report on the excavations at Compound A, in *Smithsonian Miscellaneous Collections* for 1907.

The following buildings, plazas, and courts were excavated in Compound A:

(1) Southwest building; (2) northeast building; (3) rooms on west wall; (4) six ceremonial rooms; (5) central building; (6) Font's room; (7) rooms between Casa Grande and Font's room; (8) rooms adjoining ceremonial rooms on north wall; (9) northwest room; (10) room near east wall; (11) northeast plaza; (12) central plaza; (13) east plaza; (14) southwest plaza; (15) south court.

[The most important block of rooms is of course (16) Casa Grande.]

. . . . . .

1. SOUTHWEST BUILDING

Father Font wrote of Casa Grande as follows: "The house Casa Grande forms an oblong square facing to the four cardinal points, east, west, north, and south, and round about it there are ruins indicating a fence or wall, which surrounded the house and other buildings, particularly in the corners, where it appears there has been some edifice like an interior castle or watch-tower, for in the angle which faces towards the southwest there stands a ruin with its divisions and an upper story." This southwest building is undoubtedly one of the "other buildings" referred to. [Pls. 13, 14.]

In Font's plan (fig. 117) [here, fig. 3] of Compound A, a single chambered room is represented in the southwest corner. Bartlett gave a plan of the cluster of rooms in this angle, but neither Bartlett's nor Font's plans are complete, for there are in reality six rooms in this corner of the compound, not counting an adjacent rectangular room separated from this cluster by a court. Several later authors have mentioned and figured these two fragments of walls standing above a mound southwest of the main building, and one or two have suggested that they were formerly connected with Casa Grande by walls. The best view of these pinnacles appeared in Cosmos Mindeleff's valuable account of the ruin.

The author's excavations of Compound A were begun at the base of the more western of these two standing walls, at the level of the ground, where it was found that the wall was so eroded as to be seriously undermined. It was recognized that extensive filling in was necessary at that point, and that other repairs were imperative to keep this fragment from falling. The fragment east of the last mentioned was, if anything, in a worse condition, and also required protection.

Digging down below the eroded portion, there came into view a fine smooth-faced wall, which extended several feet still lower. The excavations were then continued north and south, following the face of the wall to the northwest and southwest angles, laying bare the whole west wall. . . . After having traced this wall, attention was directed to the general character and arrangement of the walls hidden below the mound near the bases of the two fragments of walls where the excavation started. It was found that the southwest corner of the compound is occupied by a cluster of six rooms . . . the most picturesque of all those uncovered during the winter.

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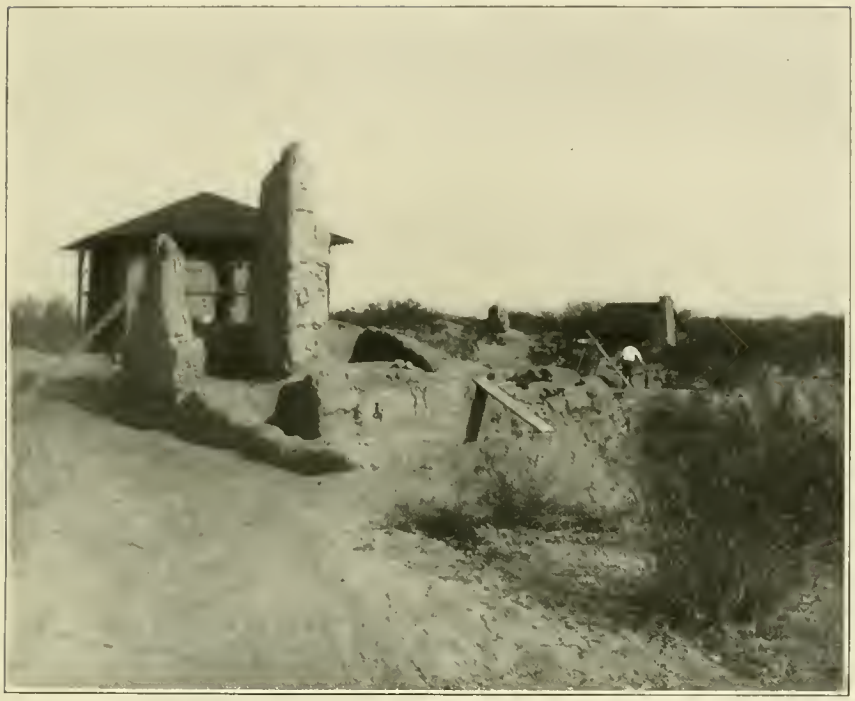
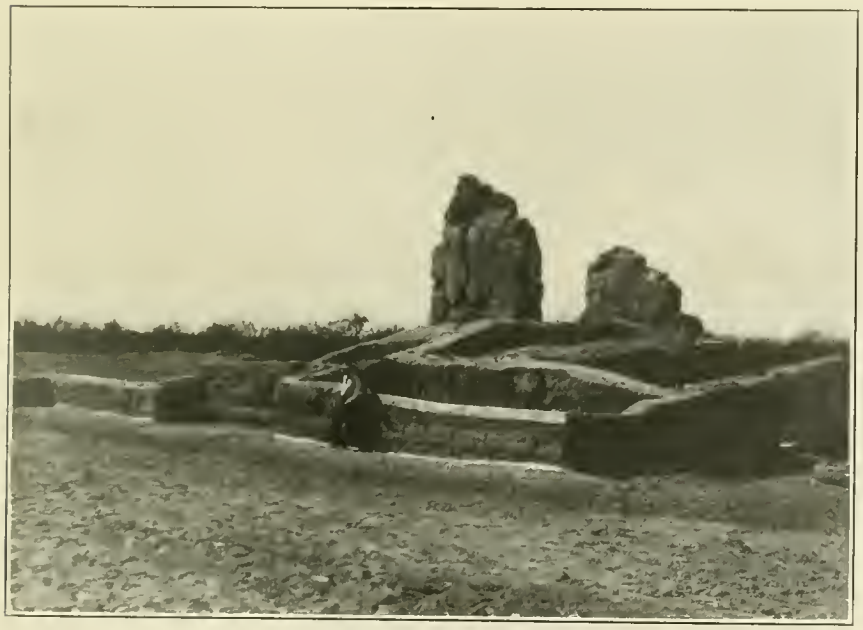
[1] The dimensions of Compound A are as follows: The length of the west wall is 419 feet; of the east wall, 420 feet; of the north wall, 223.3 feet; and of the south wall, 215 feet. The west wall bears north 3° 00′ east; the south wall, south 81° 35′ east. The west wall of the main building bears north 4° 30′ east, or south 4° 30′ west, i. e., 1° 30′ out of parallel with the compound. The dimensions of the various rooms may be seen from the ground plan (pl. 6), which is drawn to scale.



FROM THE SOUTHWEST (PARTIALLY EXCAVATED)



FROM THE NORTHEAST

SOUTHWEST BUILDING OF COMPOUND A

PARTIALLY EXCAVATED

FULLY EXCAVATED

SOUTHWEST BUILDING OF COMPOUND A, FROM THE NORTH

FROM THE SOUTHWEST

FROM THE EAST

NORTHEAST ROOMS, COMPOUND A

FROM THE WEST

FROM THE NORTHWEST

FROM THE NORTHEAST

NORTHEAST ROOMS, COMPOUND A

BEFORE EXCAVATION

AFTER EXCAVATION SHOWING NORTHEAST BUILDING

AREA ADJOINING CASA GRANDE ON THE EAST

2. NORTHEAST BUILDING

As may be seen from the ground plan (plate XXIV) [here, pl. 6], the first historic building, Casa Grande, was not the largest in Compound A. The combined length of the six ceremonial rooms is double that of the main building, although their width is much less. A building standing northeast of Font's room [pls. 15, 16] is the largest yet excavated and contains many more rooms, some of which are larger than any in the historic building.

The arrangement of the rooms in the northeast building . . . is different from that of Casa Grande . . . but is typical of others, especially the extra-mural clan houses. This similarity would lead one to suspect that this building was not, like the main building, a ceremonial, but rather a residential house. The typical form, to which reference is made, is that of a carpenter's try-square, or that of two sides of a rectangle—a form that reappears in the most southerly situated of the two clan houses on the east and the cluster of rooms in the southwest corner of Compound B. The six ceremonial rooms, together with those extending eastward from the most northerly of these along the inner surface of the north wall, make also a group of the same try-square shape. Since one arm of the northeast cluster is formed by the east wall of the compound, it follows that this arm extends approximately east and west, and necessarily the other arm of the try-square lies at right angles, or north and south. . . .

There are five rooms in the east-west arm of the northeast cluster . . . two at each end, separated by a single room. All of these rooms have comparatively massive walls, and in most the superficial covering, or plastering, is fairly well preserved. [Pl. 16.]

Room A, at the west end of the eastern arm of this try-square, had been partially excavated before the Government began work at Casa Grande, but was left in such a bad condition that parts of the east and south walls were practically destroyed. The author repaired them, filling in the badly eroded holes and walls with adobe bricks and restoring the wall as best he could to its original condition. [Pl. 17.]

Room B is one of the best-preserved rooms of those excavated. It was opened down to the level of the floor, which was found to be hard and well plastered. Midway through the center of this room . . . at equal distances from east and west walls, there are two holes, *a*, *a*, in the floor, in each of which was a log, charred by fire, but still standing erect. These vertical logs once supported a horizontal rafter extending from the east to the west wall, resting on both and on the vertical supports. Side rafters were supported by this middle log, with ends resting on the north and south walls. Upon these smaller rafters was the roof covering of reeds and clay.

The other three rooms, C, D, E, of the east-west arm of the northeast building were excavated to their floors. Their walls were found to have good surface finish, "as fine as Puebla pottery," and in one instance, D, showed superficial painting. These rooms, D and E, have no lateral doorways, a significant fact, which strengthens the belief that their former entrances were hatchways on the roof. None of the above-mentioned rooms open into one another. Large stones were found to have been used in the construction of the foundations of the north wall of room D.

The rooms of the east section . . . vary in size, and apparently some had lateral doors, others hatchways. The narrow wall of the small room, G, was supported by upright logs. A section of the fallen roof was laid bare in room H, in which the rafters and the clay upon them were well preserved. Apparently the rafters in this room had simply fallen against a side wall, the ends that formerly rested on the east wall having decayed. . . .

The walls of rooms J and K show plainly the action of fire, for large quantities of charcoal filled these rooms. G has a good floor and fine surface finish on the walls. The partitions between these rooms are, however, much broken down. In view of their supposed domiciliary character, it is interesting to point out the absence from these rooms of domestic utensils.

3. ROOMS ON THE WEST WALL

Between the cluster of rooms occupying the southwest angle of the compound and the single "bastion" or "castle" at the northwest corner, there are several rooms, the walls of which appeared when the soil was removed from the inner or east side of the west wall.

The most characteristic of these dependent rooms, G, is separated by a narrow court from the northern wall of the southwest cluster. Unfortunately, one corner of this room was cut down before its existence was detected, but wherever its four walls were revealed they indicated a room of large size. . . . In one corner there stood a large vase, too fragile to remove, which was consequently left in the place where found. The Casa Grande-Florence stage route formerly crossed the compound over the corner of this room directly above this vase.

On the west side of Casa Grande, or directly between the main building and the west wall of the compound, there were excavated several rooms, H, I, and J, the walls of which are low and single-storied. One of these rooms, J, is situated on the northwest corner of the ruin, and has its west wall continuous with that which forms the retaining wall of the north terrace. There are also two rooms on the southwestern corner which bear the same relation to the terrace wall of the south side. These two are separated by a court . . . and have low walls. There does not seem to have been a building directly west of the main ruin and no sign of a terrace now remains on that side. . . . The exact connections of the rooms along the west wall, southwest of the main ruin, with those on the southwest corner can be made clear only by continuation of the work in the unexcavated part of the compound. As shown in the ground plan, . . . there are walls standing in that part of the compound; there is also a level space called the southwest plaza, situated between the wall of the most southerly room at the southwest angle of the main ruin and the northern wall of the room on the west wall adjacent to the building in the southwest angle.

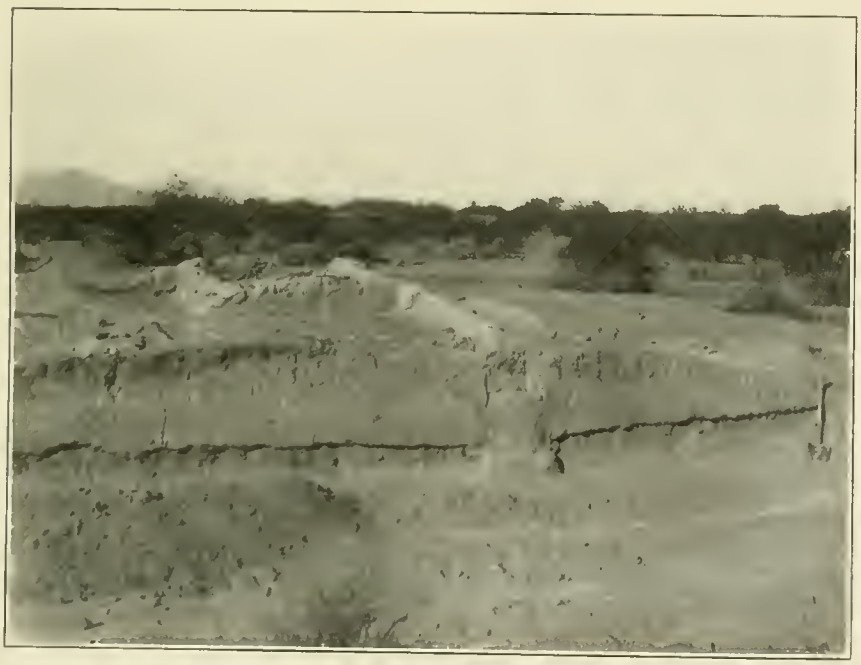
4. SIX CEREMONIAL ROOMS

Linear arrangement of rooms is exceptional in this compound. This row extends from the northeast corner of the main building to the north wall of the compound, with which the most northern room is united. The line of these rooms is not parallel with either the east or west walls of the compound, and their longest measurements vary, although the widths of the rooms are about uniform. Although the connection which formerly bound these rooms to the main building has been destroyed, there is no doubt that such a union once existed and that they were probably united to a solid terrace which we must suppose existed on the north, east, and south sides of the main building.

Before excavations were begun, the row of ceremonial rooms was indicated only by a ridge . . . of earth extending from the northeast corner of the main building northward. It is evident that the roof of these rooms was on a level with the floor of the lowest rooms of Casa Grande, which communicated with the roofs of these ceremonial rooms on the north, east, and south by means of the basal terrace, of which mention has been made. In this way one could pass directly into these rooms through the doorways in the middle of the sides of the main building.

The form, size, and general appearance of the walls of these six rooms are shown in the accompanying plan (plate 24) [here, pl. 6] and in plate XXX, *a* and *b* [here, pls. 18, 19]. All these rooms were excavated to their floors, the soil from them being removed beyond the surrounding wall of the compound. Earth was likewise taken from the west side, opening the east portion of the northwest plaza, so that the walls on that side now average five feet in height.

FROM THE SOUTH



WALL SHOWING EFFECTS OF EARLY EROSION

SIX CEREMONIAL ROOMS, COMPOUND A

SIX CEREMONIAL ROOMS, FROM THE WEST

NORTHWEST PLAZA, EAST SIDE, SHOWING WORK OF EXCAVATION

CEREMONIAL ROOMS AND PLAZA, COMPOUND A

BEFORE EXCAVATION

AFTER EXCAVATION

WEST WALL OF FONT'S ROOM, FROM THE SOUTHEAST

EAST ROOMS, COMPOUND A

5. CENTRAL BUILDING

When work was begun on Compound A the central building was a low, regular mound . . . situated near the southeast angle of the main building, occupying a somewhat similar relation to that corner that the first of the six ceremonial rooms does to the northeast angle. This mound was opened to the base, revealing several intersecting walls and rooms (plate XXIV) [here, pl. 6]. When one stands at the north wall of the compound and runs his eye along the east side of the six ceremonial rooms, it is found that the middle wall of the central building is in the line of the eye, which also follows the supposititious retaining wall of the east terrace of the main building and the east boundary wall of the southwest plaza. The southeast corner of the main building, Casa Grande, is broken in much the same way as the northeast angle near the six ceremonial rooms, possibly from the same cause.

6. FONT'S ROOM

Mange states that Father Kino said mass in the Casas Grandes, and it is generally believed that this ceremony was performed in one of the rooms of Casa Grande. As there were at the time of Kino's visit several other rooms in the group, some of which were more commodious, it is interesting to speculate on the possibility of one of these being that referred to.

Just east of Casa Grande was a large building (plate XXIV) [see accompanying pl. 20], formerly two stories high, which was apparently in a fair state of preservation when Father Font visited it in 1775. So accurately has this zealous priest described . . . and mapped this room, that it is called after him and is referred to as "Font's room" in this article.

Mange states in his diary that "a crossbow shot farther on 12 other houses are seen half tumbled down, also with thick walls and all with roofs burnt except one room beneath one house, with round beams, smooth and not thick, which appear to be cedar or savin, and over them rush reeds very similar to them and a layer of mortar and hard clay, making a ceiling or story of very peculiar character."

Font, 70 years after, wrote: "In front of the east door, separated from the Casa, there is another building with dimensions from north to south 26 feet and from east to west 18, exclusive of the thickness of the walls." . . .

Although it was possible in 1694 for the observer, standing on the roof of Casa Grande, to see the walls of all the buildings which were excavated by the author, the best preserved of all, judging from Font's account, was that named after him. At that time this was apparently the only two-storied building in good preservation east of the main one, which could be designated as "one room beneath one house." The general appearance of this building last October (1906) is shown in the accompanying plate (XXXIV, *a*, *b*,) [here, pl. 21]. The upright wall of this room was the only fragment besides the main building above ground, with exception of the two walls at the southwest angle. The condition of the base of this wall necessitated immediate repair; for, although 3 feet thick, it was so undermined that light was visible through holes in the base. The author erected on its east side a buttress of adobe bricks to strengthen it, and took other precautionary measures to keep what was left from falling. The row of holes in which were formerly inserted the ends of the rafters of the upper chamber can still be seen in the east face of the wall.

Directly west of Font's room is a passageway communicating with the central plaza. The floor of this passageway is hard and very compact, and on one side there were excavated an eagle skeleton and bones of several rabbits.

7. ROOMS BETWEEN CASA GRANDE AND FONT'S ROOM

East of Casa Grande there were several large rooms, A–E (plate XXXII, *b*) [here, pl. 21], with low massive walls, evidently of one story. It would appear that in ancient times these rooms joined the terrace at the base of Casa Grande, and we may suppose that their roofs were on the level with the floor of the lowest room of the historic building. Apparently these rooms were not all constructed at the same time, the two at the north showing evidences of being older than the southern pair. . . .

One of these rooms, C, was found to contain much débris, consisting of pottery fragments, charred basketry, cloth, maize, mesquite beans, . . . marine shells, and other objects. It appears to have been a dumping place, and as it has every appearance of having once been a room, we may suppose that it was deserted while some of the other rooms of Compound A were still inhabited.

8. ROOMS ADJOINING THE MOST NORTHERLY OF THE SIX CEREMONIAL ROOMS

Adjoining the most northerly of the six ceremonial rooms on its east side, there lies a room or court, G, surrounded by walls, which appears to have been without a roof. . . . Its floor is hard, as if made so by the tramp of many feet; its walls are massive, with smooth surfaces. A walled-up doorway, recalling a similar feature in the west room of the main building, occurs in the wall separating this room from the most northerly of the six ceremonial rooms.

In the surface of the west wall of this room, at the level of the floor, there is a deep erosion of the wall (plate XXIX) [here, pl. 22, *a*], due to former weathering. The south wall of this inclosure was evidently built since the erosion took place, for its end is so constructed that it extends into the eroded region, following the imperfection in the surface without being itself weathered at that level. The five rooms, G–K, forming the west building are large and have massive walls. No evidences of roofs occur, and lateral doorways are absent except in the east side of I. K shows evidence of an east wall, and the narrow enclosure H is more of a court than a room. A pile of wooden hoes or planting sticks (plate XXXIX, *g*) [here, pl. 76] was found on the floor of room I.

9. NORTHWEST ROOM

The dimensions of the room [pl. 22, *b*] occupying the northwest angle of Compound A [pl. 23] appear in the accompanying plan [here, pl. 6]. . . . This room is single storied with free walls on two sides, the other sides being the walls of the compound. An entrance into the compound on the north side is situated near this corner room.

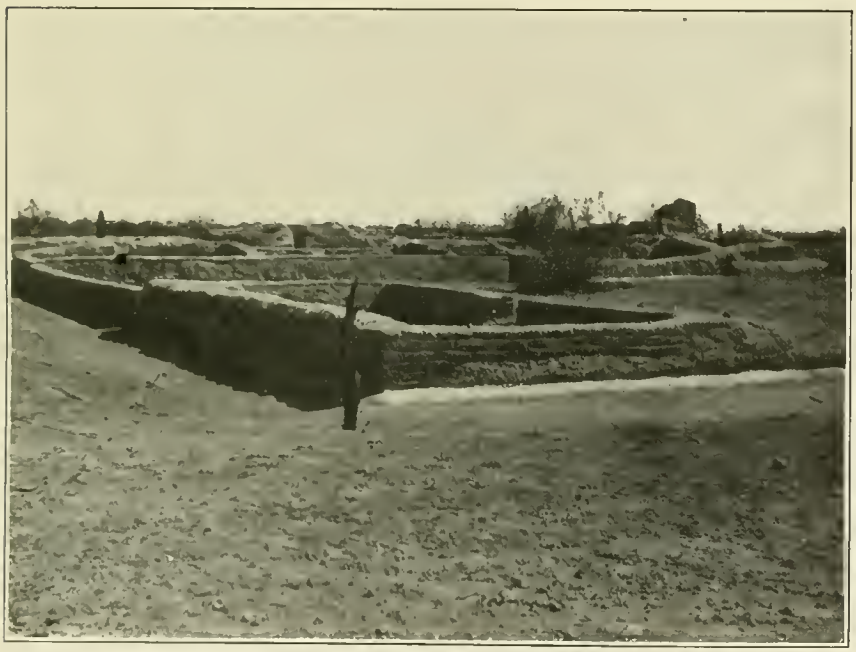
The excavations revealed many ceremonial objects on the floor, which would appear to indicate that the room was used for other than secular purposes. Household utensils, as grinding stones, which would be expected in a living chamber, were absent. No soot or other evidences of a fire were observed on the walls, and there were no charred logs or rafters.

10. ROOMS NEAR EAST WALL

South of the plaza which lies to the eastward of the two-storied building known as Font's room are situated the remains of some massive walls which formed a large square enclosure separated from the east wall only by a narrow passage. . . .

This building was evidently formerly one story high. Its size is so great that it is doubtful whether or not it was roofed, but if it had a roof it would be one of the largest rooms of Compound A.

a, NORTH ROOMS

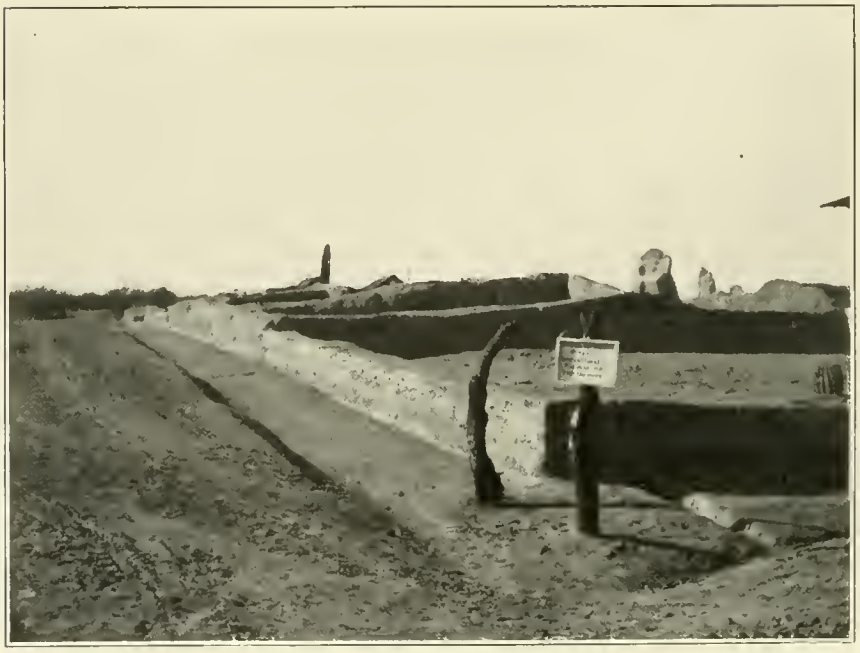


b, NORTHWEST CORNER

ROOMS AND CORNER, COMPOUND A

NORTHWEST CORNER, COMPOUND A

FROM THE EAST



FROM THE NORTHEAST

NORTHEAST CORNER, COMPOUND A

11. NORTHEAST PLAZA

The removal of earth to a depth necessary to show the original height of the walls about this plaza was a work of some magnitude, but was accomplished in a short time. . . . The plaza (plate XXVIII, *a*) [here, pl. 24] was not apparent until after the position of the northeast angle of the compound had been determined and the walls of the northeast building had been excavated.

The situation of this plaza and the fact that no doorways opened into it or terraced roofs looked down upon it imply that it was not a favorite one for ceremonial dances or spectacular performances. As the walls about it are, as a rule, massive, the plaza may have served as a safe place to which to flee for protection, and it is probable that cabins, not unlike the Pima huts of the last generation, were temporarily erected in this and other plazas.

12. CENTRAL PLAZA

The centrally placed, and on that account probably the most sacred, plaza . . . of Compound A is surrounded by buildings, the roofs of which no doubt served as elevations from which spectators could witness the sacred dances and games. The floor of this plaza was solid, apparently hardened by constant tramping of feet. The labor involved in cutting down the earth in this plaza to the former floor was considerable, it being necessary to remove many cubic yards of grout that had fallen from the thick walls of the northeast building and the six ceremonial rooms. The southwest corner of the plaza was not excavated, because of a large stake to which is attached the iron rod that serves as a guy for the northeast corner of the roof built over the ruin.

The plaza appears to have been used as a burial place, for a human skeleton was dug out of the floor near its southeast corner; but the body might have been buried after the compound had been deserted.

There were excavated from this plaza, near the passageway west of the tall wall of Font's room, the skeleton of an eagle and several rabbit bones. It was probably customary at Casa Grande to domesticate eagles for their feathers and to keep them in confinement.

13. EAST PLAZA

This plaza was almost wholly surrounded by rooms, and from its position was evidently one of the most popular of all the inclosures of this kind. From the roof of the main building one could probably look over Font's room into this plaza. Although the plaza is a small one, its eastern position would give it considerable ceremonial importance. The accumulated earth was cut down to the original level and removed outside the compound. There does not seem to be sufficient evidence that there was an eastern entrance way to this plaza, although it was looked for when excavations were made. . . .

14. SOUTHWEST PLAZA

This plaza [pl. 14, upper] adjoins the west wall of the compound, extending from the rooms southwest of the main ruin to the first of the cluster of rooms in the southwest angle. Although large quantities of earth were removed from this enclosure, it has not been wholly leveled to the floor, especially on the east side, near a wall which is a continuation of the rooms at the southwest corner of the main ruin. This wall was exposed along its whole length, but showed no rooms on the west side, although probably there are several on the east, or unexcavated, side. . . .

15. SOUTH COURT

A long court extends across the whole south end of the compound from the southwest cluster of rooms to the east wall. Its form suggests a ball court or course for foot races. In connection with the former suggestion it is interesting to note that several stone

balls, such as were used, according to Pima legends, in a game of kicking ball, were found in this court; this game is still practiced by the Pimas. Near one end there was excavated a square perforated stone, recalling that through which balls were thrown in the Nahuatl game of pelote.

As will be seen from the accompanying plan (pl. 6) of Compound A, the whole inclosure has not been completely excavated, but enough débris has been removed to show its general character. There are no large unexcavated mounds remaining in this compound, and the level space in the southeastern part was either a plaza or, more probably, the site of many habitations, whose fragile walls have fallen, raising the surface to a uniform height. On this supposition we should look here for the remains of houses in which the majority of the people lived.

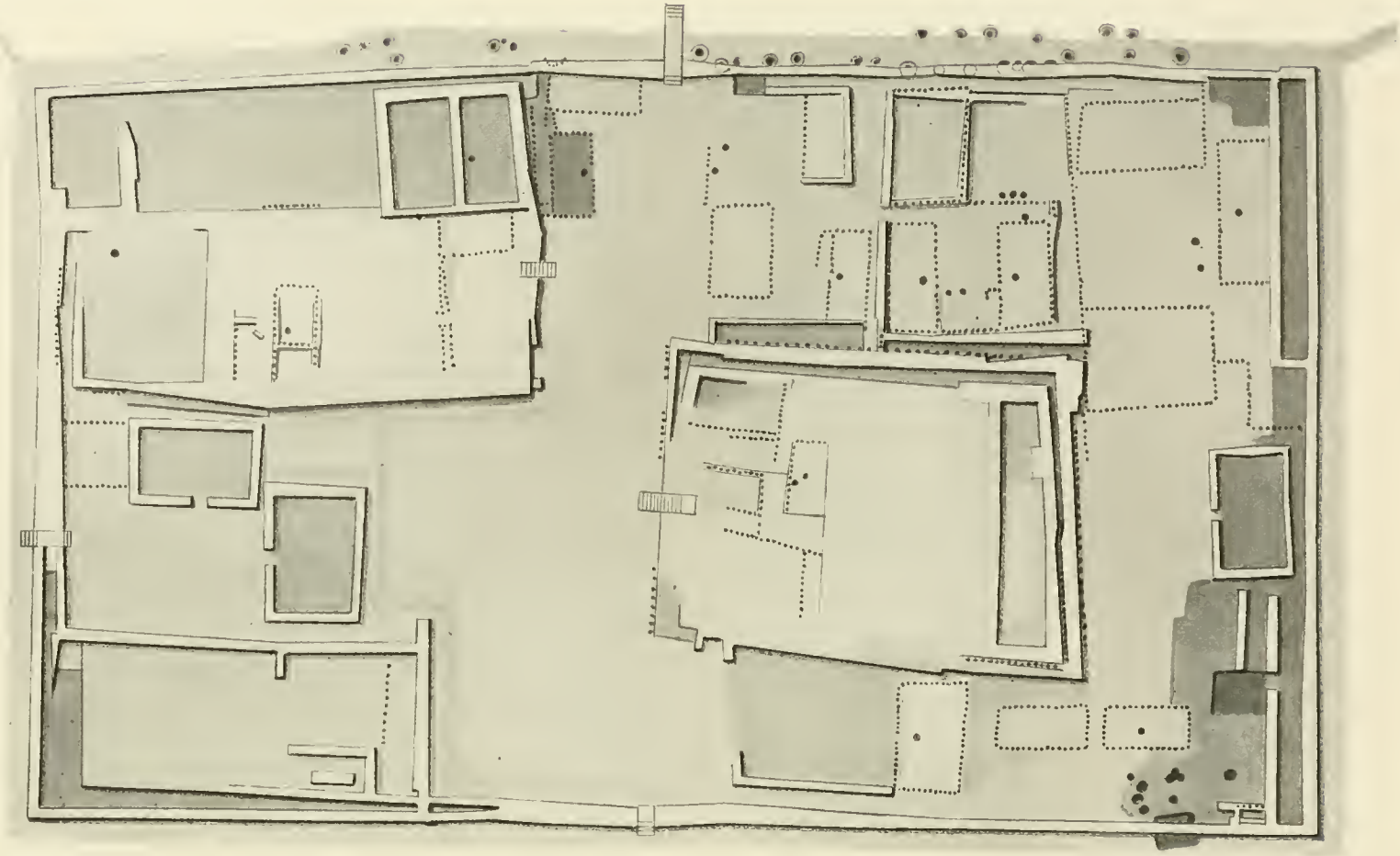
From the study of Compound A we can get an idea of the structural character of one of these Gila Valley prehistoric settlements. The people lived in clusters of houses surrounded by a common wall, which inclosed also massive houses that served as temples or as citadels for protection. Regarding the sociologic condition, whether each compound housed and protected many families unrelated by blood, or clans related to one another, can not be determined from the information available. That the compounds may have been built at different times appears probable, but it can hardly be supposed that one compound was completely deserted at one time and that the inhabitants might have moved to another site a few hundred feet away. If these compounds were inhabited at the same time, it may be readily supposed that there was considerable intermarriage of clans and therefore intermingling of blood. As no known legends speak of more than one chief of Casa Grande, the supposition is that the inhabitants recognized only one head. There is ground for the belief that the age of Compound A is not so great as that of Compound B, although it is of considerable antiquity. Casa Grande itself seems to have been constructed at different times, as it shows evidences of growth by a series of additions. There are no known data by which its age can be computed and none to determine which compound was the last to be deserted. It is known that Compound A was a ruin in 1694, but from the earliest accounts nothing can be ascertained which would show how long before that date the ancients occupied the buildings. The indications afforded by the rate of wear of the walls since the beginning of the eighteenth century lead to the belief that a few generations before that time Casa Grande was a populous settlement.

The orientation of the surrounding walls of the compounds and of the buildings within them is well-marked, this feature appearing very significantly in Compound A. The greatest length of all the compounds is north and south. The doorways of the buildings, when practicable, open toward the east.

FROM THE WEST

FROM THE EAST, SHOWING TERRACE

COMPOUND B, BEFORE EXCAVATION



GROUND PLAN OF COMPOUND B

(From survey by Pinckley and Hartshorne)

N.
180 FEET
DRAIN
207 FEET
DRAIN
NORTH PLAZA
A PRIMARY
SHRINE
STAIRS
OPENS
MIDDLE PLAZA
B PRIMARY
SHRINE
PLAZA
PLAZA
SOUTH PLAZA
STAIRS
OLD WALL
NEW WALL
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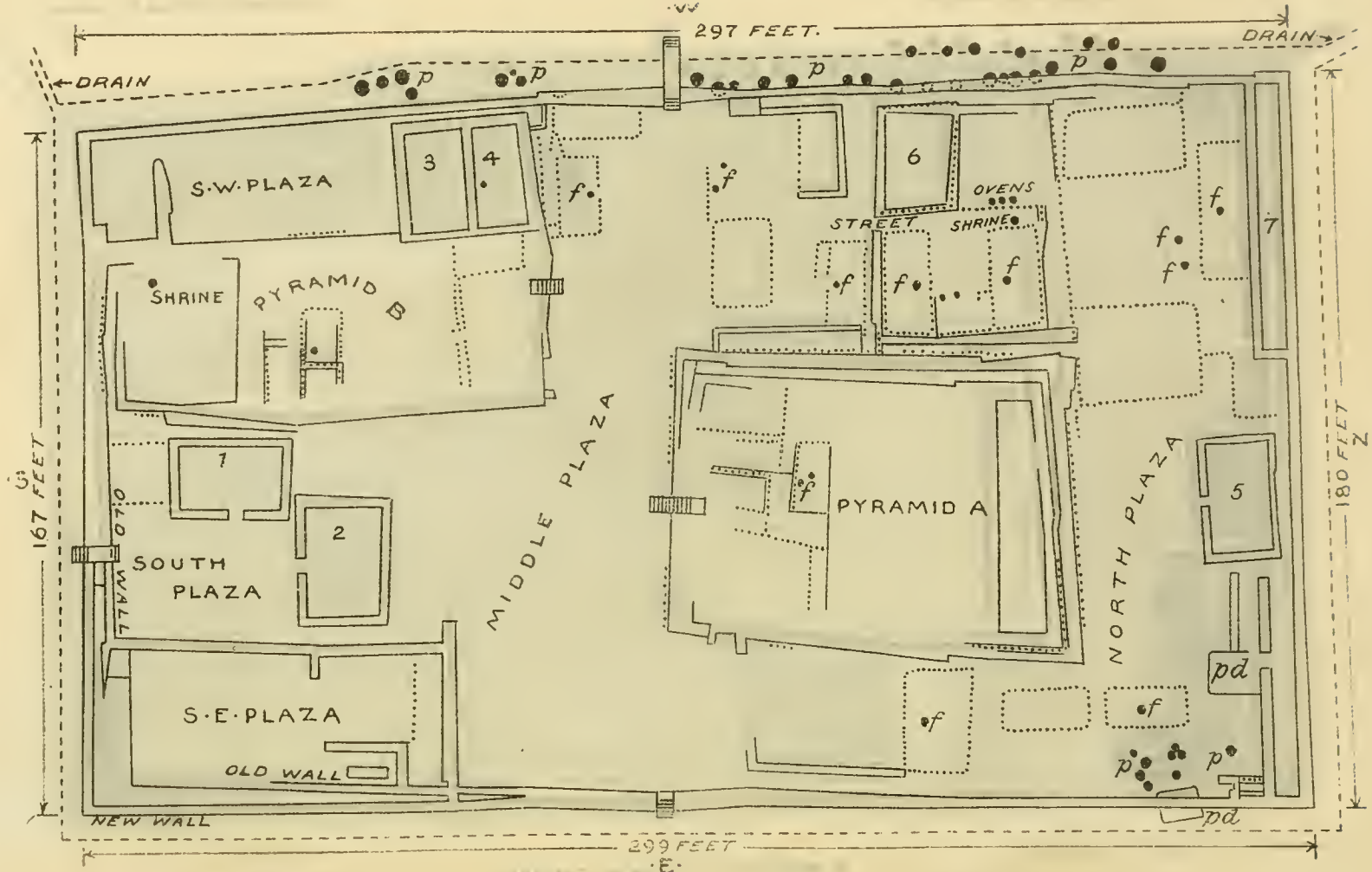
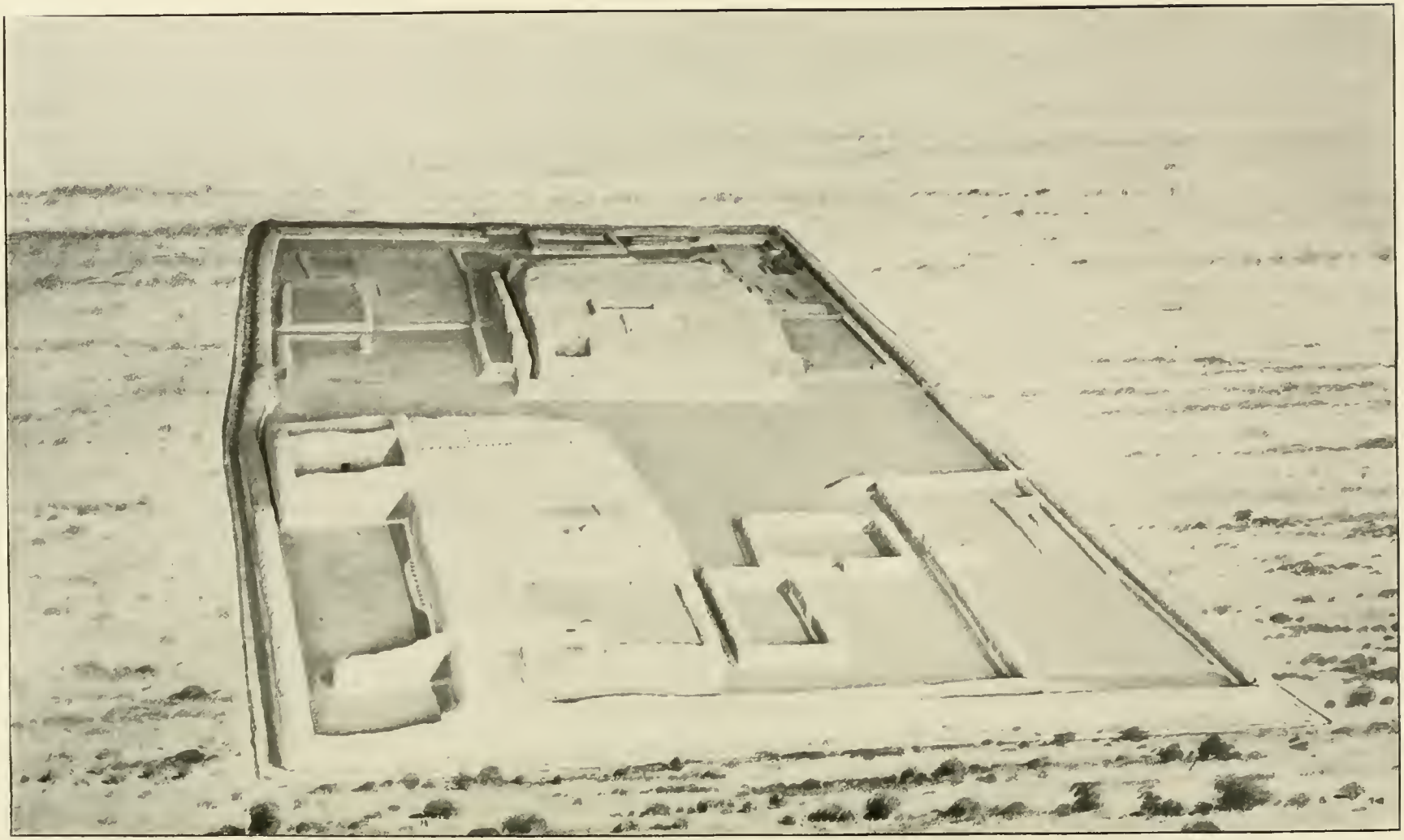


1. Room with plastered wall.
2. Massive-walled room.
3, 4. Ceremonial rooms (entered from roof).
5. Ceremonial room.
6. Room with massive walls supported by posts.
7. Race course (?).
f. Fireplaces.
p. Pits in which mortar was mixed.
pd. Subterranean rooms.



BIRD'S-EYE VIEW OF COMPOUND B, FROM THE SOUTH

(From photograph of model by Hendley)

In certain walls is found evidence contradicting the theory that they were built by stamping caliche into bottomless baskets or boxes, as generally taught, and as indicated by the joints on the west side of the main ruin. At various places in the walls may still be seen masses of clay patted into shape by human hands, the imprints of which are clear. Some of these masses, which are just large enough to have been handled by one workman, were evidently dumped on the wall and subsequently were not so stamped that they lost their original shape.

Compound B

When work on it began (pl. 25) Compound B consisted of two mounds resting on a platform, the bases around both mounds being so filled in with earth that the surrounding wall formed the edge of a platform or terrace. The most extensive of these inclosed mounds (Pyramid B) occupied the southwest corner of the platform. The largest and most massive (Pyramid A) has a flat top, from which the visitor can see, in clear weather, the cupola of the courthouse in Florence, 12 miles away.

Compound B (fig. 13) is 840 feet northeast of Compound A. Its excavated surrounding wall on the east and north sides, respectively, measures 299 feet and 180 feet; the west side is 297 feet long and the south side 167 feet. The compound is oriented approximately north and south (pls. 26, 27).

When the excavation of Compound B began no part of the surrounding wall was visible, its existence being indicated only by a slight rise above the level of the surrounding plain. The first work attempted was the determination of the angles or corners of this compound. This work brought to light a massive wall surrounding the whole inclosure. It is evident from the amount of débris that had accumulated on the outside of this wall that it must have been formerly at least 7 feet high. The accumulated earth was removed to a depth of 4 feet, the present average height of the wall. This wall was found to be much higher on the west side than on the east, south, or north, and in order to obtain a level for the drain constructed around the compound to carry away the surplus water, it was necessary to remove débris on the west wall to a depth of at least 9 feet. Below that depth many circular depressions, similar to those used by Pima in mixing mortar for the walls, were found, and it is believed that the former level of the foundation of the compound was reached on that side.

None of the outside walls of Compound B laid bare by excavation were found to be straight and none were exactly perpendicular. The thickness of the surrounding wall varies; in some places it is

as much as 5 feet and is, on the average, about 3½ feet. Outside the wall, about 7 feet from the former foundation, was dug a shallow ditch surrounding the whole compound. This ditch was continued

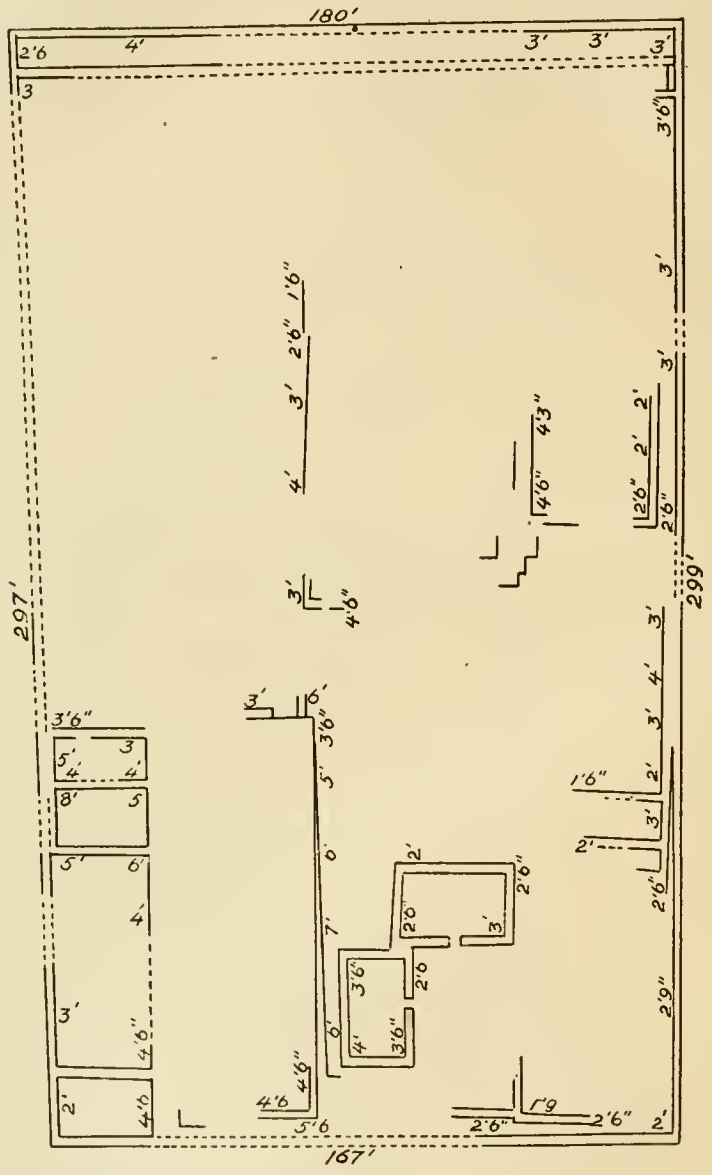
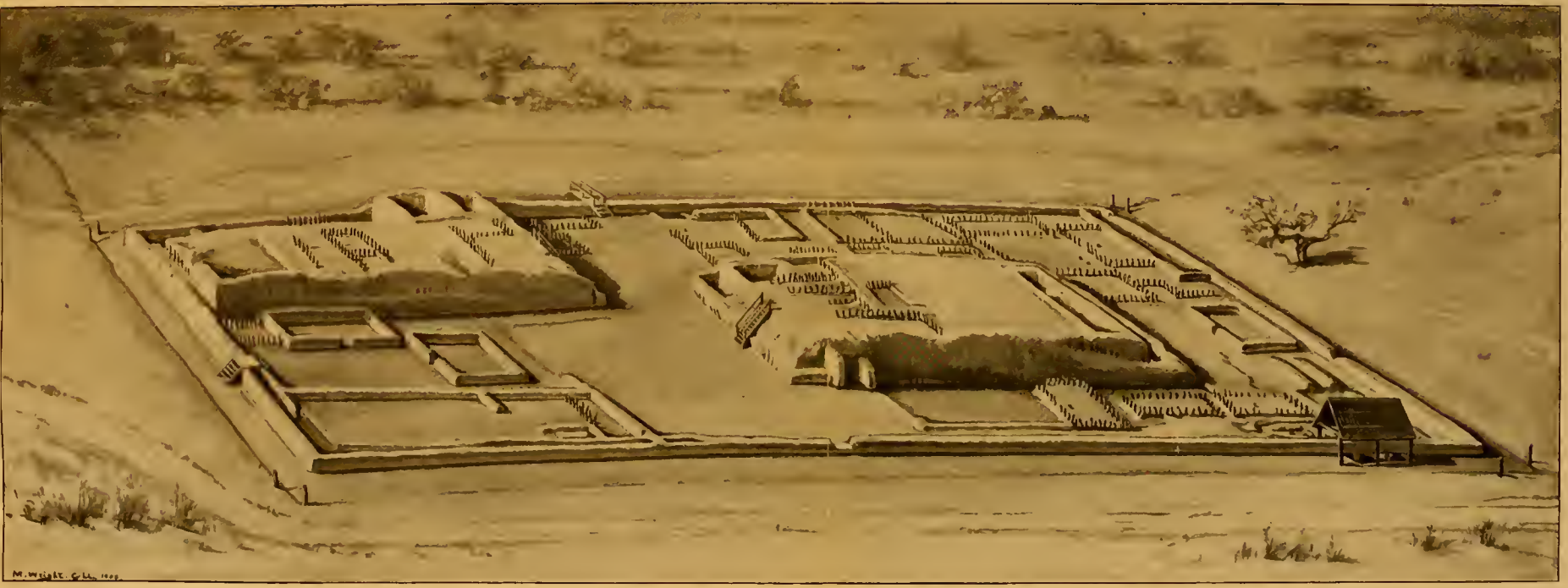


FIG 13. Ground plan of Compound B (made before completion of excavation), showing height of walls in feet.

into deeper ones extending from the northwest and southwest corners (pl. 35) in order to carry all superfluous water from the foundations of the walls into a natural depression some 50 feet from the compound. (Pl. 28.)



BIRD'S-EYE VIEW OF COMPOUND B, FROM THE EAST

EXTERIOR

INTERIOR

NORTHEAST CORNER, COMPOUND B

a, SOUTHEAST CORNER

b, ROOMS EAST OF PYRAMID B

CORNER AND ROOMS, COMPOUND B

PLAZA AND ROOMS EAST OF PYRAMID A

ROOMS SOUTH OF PYRAMID A

PLAZA AND ROOMS, COMPOUND B

INSIDE THE WEST WALL

ROOMS WEST OF PYRAMID A

LOOKING SOUTHEAST FROM PYRAMID A

WALLS AND ROOMS, COMPOUND B

NORTH PLAZA OF PYRAMID A

SOUTH WALL

NORTH WALL

PLAZA AND WALLS, COMPOUND B

A subterranean room provided with a cemented floor, walls, and fireplace, was discovered near the northeast corner, under the foundation of the exterior wall.[1] This was evidently a pit-house inhabited before the massive wall had been constructed and antedating the structures built above it. Traces of similar subterranean rooms are found within the compound, near the same corner (pl. 29).

The outside wall of Compound B was constructed, like that of Casa Grande proper, of huge blocks of natural cement, which were made where they now rest, the marks of successive blocks being visible at several points where the union is not perfect. Evidences that this wall had been repaired by ancient builders are seen in many places, and it appears that the form and direction of the original wall have been modified by its enlargement at the southeast corner (pl. 30). Within the inclosure surrounded by the massive exterior wall were found evidences of two kinds of buildings: First, those made of cement blocks, characteristically massive; second, those having fragile walls supported by upright posts. Some of the walls of buildings of the former class still remain upright, but those of the latter have fallen, their positions being indicated only by decayed stumps. To the first type belong also well-plastered floors, in which are present circular depressions that served as fireplaces. If we interpret buildings of the first type as temples used for ceremonial purposes, the fragile-walled buildings may be regarded as habitations of the people comparable with those in which the Pima have lived since known to history.

PYRAMID A

The two large pyramidal elevations, occupying much of the inclosure of Compound B, were found on excavation to be remarkable structures, suggesting a style of architecture common in Mexico. It appears that the larger and most northerly of these structures, designated on the map as A (pls. 31, 32, 33), was a pyramid, formerly marked by the presence of two or three terraces, the massive walls of which still rise at one point to a height of more than 10 feet. The top of this pyramid (pl. 31) is square and level. A deep excavation made in its north end revealed a long chamber, suggesting the north room of Casa Grande. On the southwest side of this pyramid shallow excavations revealed several cemented floors, one below another, and vertical walls indicated by decayed posts which formerly supported them; each of these floors contains a well-made fire pit. The shape of the rooms (pls. 32, 33), as shown by the positions of the stumps, was rectangular; the length was double the width. A doorway, indicated by the absence of upright logs from one side, was just in front of the fire-

[1] The diagonals of none of the rooms at Casa Grande are exactly equal in length.

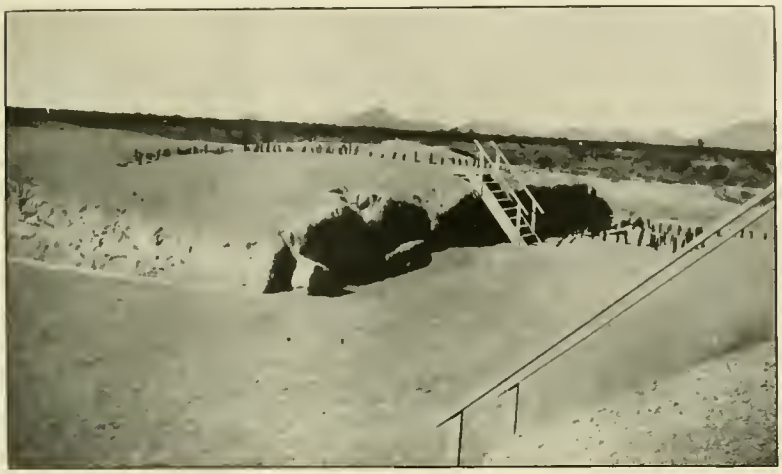
place, which itself was situated not in the center of the room but slightly nearer one side. The existence of these floors, or evidences of rooms situated one above the other, would seem to indicate that a considerable portion of this pyramid was formed by accumulations of earth resulting from the decay of habitations; the supposition is that this accumulation continued through a long period, and that new habitations were built on the débris of those below. Excavations extended in the southwest angle of the pyramid to a level with the outside plazas showed that there were in this mound seven layers of floors, indicating by the above theory seven successive constructions or times of habitation.

PYRAMID B

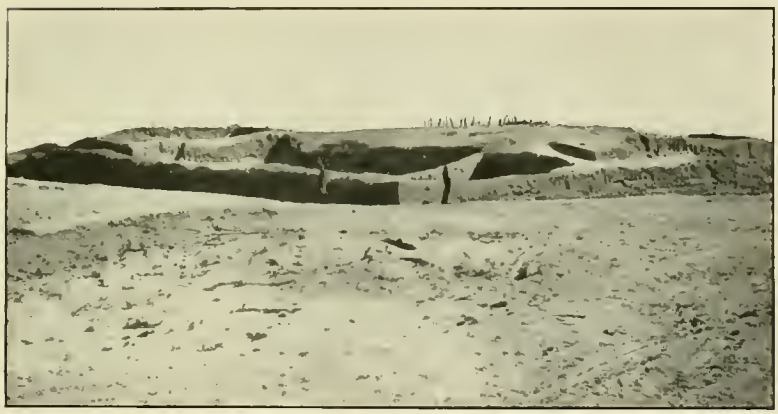
Pyramid B (pl. 34), which is situated in the southwest section of Compound B, is separated in part from the west wall of the compound by a plaza 100 feet long by 50 feet wide. The pyramidal form, so well seen in Pyramid A, does not appear in Pyramid B (pl. 36, *b*), the shape of which is trisquare, a mound extending north and south with a western extension. On the top of this mound, as on Pyramid A, were found floors of houses whose upright walls were indicated by decayed posts; below were other floors, resembling those found on top of Pyramid A. There were remains of a shrine (pls. 26, 35) at the southwest corner of the top of Pyramid B; in it were found fragments of copper and many strangely-formed stones. The north end of Pyramid B (pl. 35), extending toward the west wall of the compound and forming the north wall of the southwest plaza, was occupied by two rooms, the massive walls of which are 8 feet high and average 4 feet thick. The ground plan of these rooms resembles in shape a trisquare. Their common west wall is separated from the west wall of the compound by a passageway, through which one formerly could enter the southwest plaza from the central plaza.[1] The walls show no indication of a side entrance, and no proof was obtained that the rooms were roofed; the most logical supposition is that they were entered from the top of the adjacent mound by means of ladders or notched logs. Each of these rooms had a fireplace near the middle of the room, well-plastered floors, and vertical walls; they have no lateral openings for communication with each other.

In one of these rooms was found a mass of caliche about the size of a small keg, which had a cavity in one end, while the opposite extremity was rounded. This object resembled a rude stove or

[1] These narrow passageways exist also in Compound A, as between Font's room and the massive-walled structures east of the main building.



NORTHEAST CORNER OF PYRAMID B



PYRAMID B, FROM THE SOUTHWEST

SOUTHWEST CORNER OF PYRAMID A

VIEWS OF PYRAMIDS A AND B, COMPOUND B

SOUTHWEST CORNER

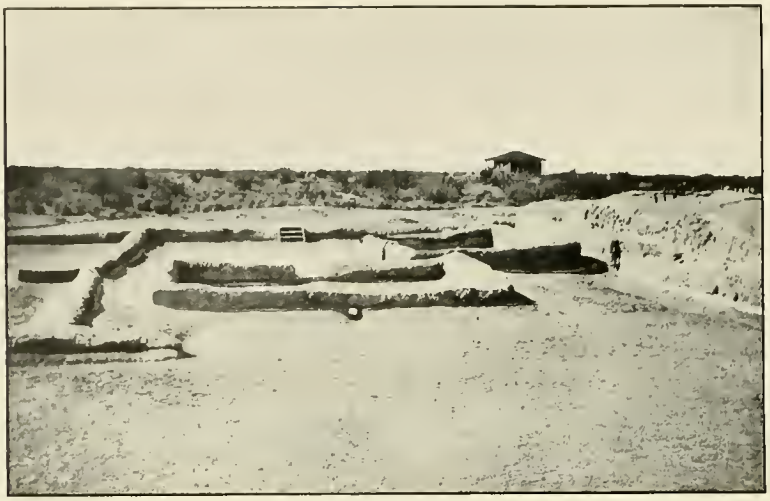
NORTHWEST CORNER

CORNERS OF COMPOUND B

a, SOUTH AND SOUTHEAST PLAZAS OF PYRAMID B

b, ROOMS NORTH OF PYRAMID B

PLAZAS AND ROOMS, COMPOUND B



a. SOUTH PLAZA

b, ROOMS OF SOUTHEAST CORNER

c, ROOMS EAST OF PYRAMID B

PLAZA AND ROOMS, COMPOUND B

oven,[1] the cavity being used formerly for storage of fuel. A somewhat similar object was found buried under or near the west wall of Compound C (see fig. 14). The other objects found in these rooms are evidently ceremonial and perhaps served somewhat the same purpose as those found in the large rooms of Casa Grande.

In the floor of what appears to have been either a room or a small plaza, on top of Pyramid B at its southwest corner (pl. 35), was found a shallow pit or depression about a foot in diameter, which had a hemispherical cover made of caliche; this cover, which was perforated by two holes, fitted accurately into the depression. The purpose of this pit and cover was not ascertained, nothing being found that afforded any clue to their use.

ROOMS EAST OF PYRAMID B

The inclosure east of Pyramid B and south of Pyramid A forms a large plaza, in the southern part of which are several buildings of massive proportions. These (pls. 30; 36, *a;* 37, *b, c*) have been excavated to their floors, which are well preserved. Two of these rooms are especially noteworthy. These were formerly a single story in height and show no evidence of ever having been higher. Although separated by a narrow court or passageway, both rooms open into the same court through well-made doorways the jambs and thresholds of which are smooth and well preserved. When these rooms were uncovered it was found that their floors were made of hardened adobe upon which, when first brought to light, could be seen impressions of matting, laid upon them when the room was inhabited. This would seem to show that the ancient people of Casa Grande used a kind of sleeping mat, similar to that employed by the Pima Indians. The preservation of these impressions for so long a time is certainly remarkable.

The walls of these rooms are covered with several layers of smooth plaster, each very carefully applied. The size and shape of the rooms lead to the belief that they were connected with ceremonial rather than with domestic life. In the open places (pl. 37, *b, c*) adjoining these chambers, the former existence of rectangular rooms is indicated by rows of holes in which were found decayed fragments of wooden posts that had formerly supported the fragile walls, long since fallen. Where possible, these were carefully replaced by new logs. The number of these habitations could not be determined. Their floors may be traced by the remaining cement, hardened by the tramping of many feet, but no fireplaces were found in these floors or in the walled buildings east of Pyramid B.

[1] Like the pits the Hopi use in baking their ceremonial pudding (*pigume*).

SOUTHEAST PLAZA

In the southeast plaza (pl. 30, *b*) of Compound B evidences of several rooms were brought to light, although for the greater part their once massive walls were very much broken down. Here were found indications of fragile-walled rooms, their floors situated one above another, separated by a few inches of soil. There had evidently been a change of plan in this quarter which had led to secondary construction, thus modifying more or less the original architecture. The exterior walls of the compound at this point and for about 50 feet north along the east wall are double. Within the inclosure near the southeast angle[1] appeared rows of decayed posts, remains of walls, arranged in quadrangular form, indicating the former existence of several fragile-walled dwellings.

East of Pyramid A, between it and the east wall of the compound, were traced portions of the massive walls of a large building, very much mutilated. To the north of this building are remains of three fine rectangular buildings having well-formed floors, fireplaces, and walls.

NORTH PLAZA

Due north of Pyramid A, between it and the north wall, from which it is separated by a narrow passage, was found a large building fully 40 feet long; the floor is partially subterranean and the doorway opens to the south. Between this building (pl. 41, *a*, *b*) and the northeast corner of the compound were other massive rooms the walls of which are destroyed to so great an extent that their ground plan can not satisfactorily be traced. In this region reoccurs evidence of successive strata of floors (pl. 41, *a*), suggesting repeated occupancy of the same site by the rebuilding of new houses on the débris formed by the destruction of older ones. Almost all the north side of this compound is occupied by a room 15 feet wide and extending in length about 80 feet eastward from the northwest angle. The use of a room of this shape and size is conjectural. There is no evidence of the former existence in this area of rooms of fragile construction.

WEST AREA

The west area of the inclosure (pls. 36, *b;* 38; 39, *b*), or the section north of Pyramid B, was wholly covered with fragile-walled buildings, the remnants of which show that they were built along streets and around courts, which can still readily be traced. Here occur also remnants of thick walls, indicating dwellings of moderate height but without large rooms. It would seem from the arrangement of the rows of holes in which the upright supports of the former walls stood,

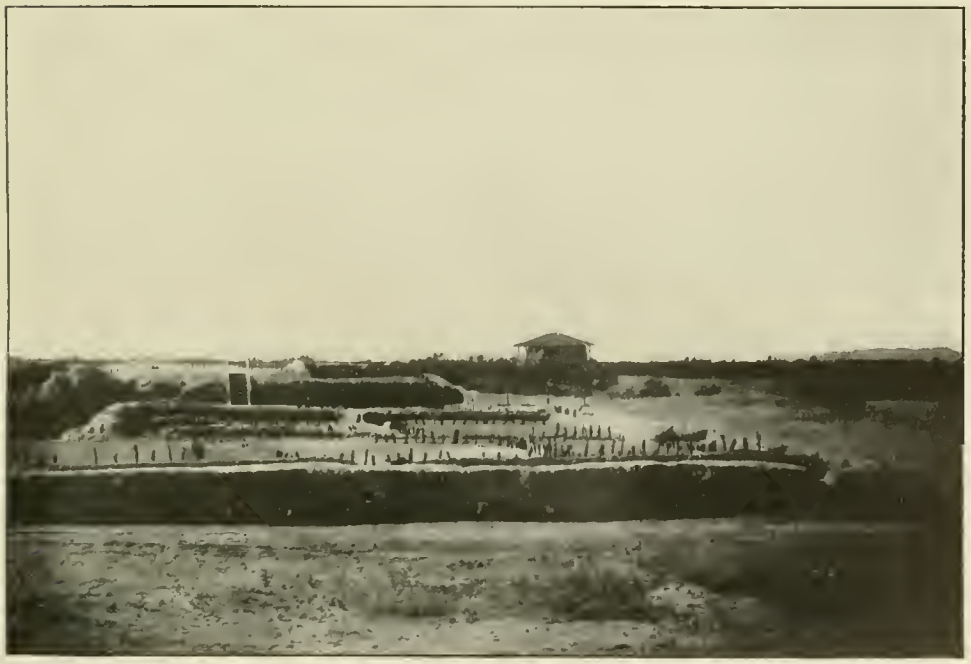
[1] It was not possible to trace the rooms by means of the remaining walls in the southeast angle of this inclosure, owing in part to the dilapidated condition of these walls.

RESERVOIR

ROOMS NORTH OF PYRAMID B

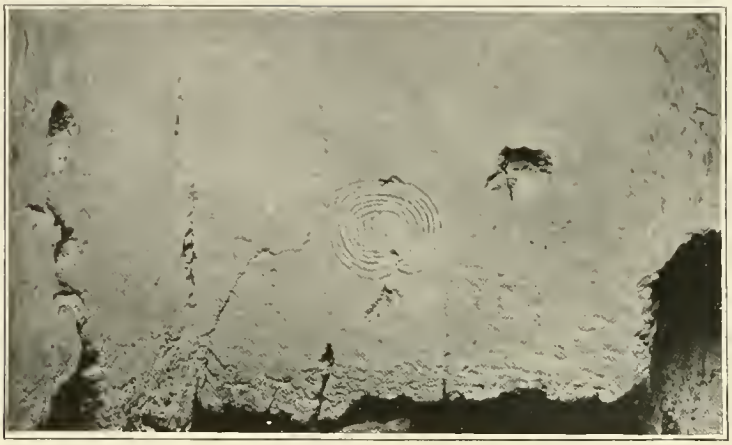
TYPICAL ANCIENT RESERVOIR, AND ROOMS OF COMPOUND B

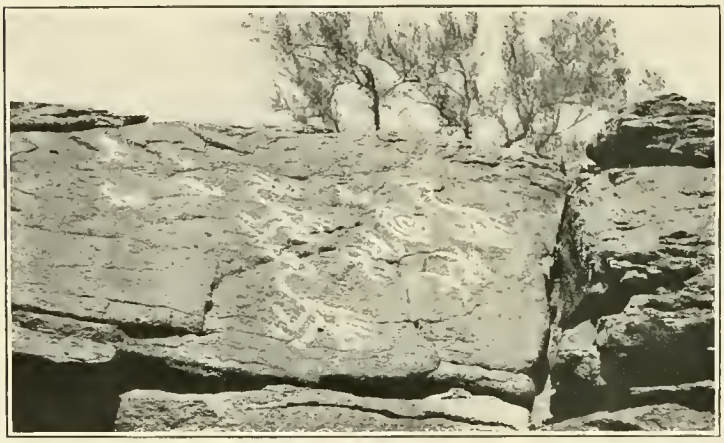
a, WEST WALL, LOOKING SOUTH

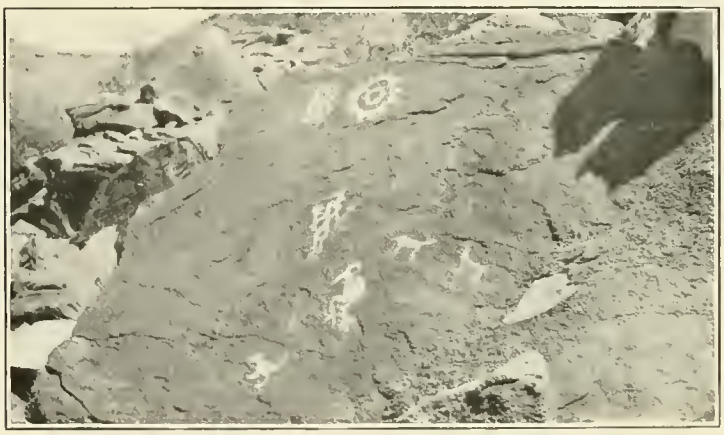


b, WEST END OF NORTH WALL

WALLS OF COMPOUND B







PICTOGRAPHS FROM CASA GRANDE AND VICINITY

that a street, extending north and south, bisected this section of the compound and that rooms were arranged along both sides. These rooms were rectangular, with a fire-pot or fireplace in the floor of each, at or near the center; the doorways are in the longer side, about midway.

Attention should be called to a room of this row, on the north side of the street about west of the middle pyramid. West of the great Pyramid A was an inclosure in the walls of a house, containing three small stone idols (pl. 26, shrine) and a number of oddly formed stones, all suggestive of shrine deposits.[1]

When the workmen who had excavated this shrine and removed its contents ceased work, one of the Pima made a symbol called *tcuhuki* ("house of Tcuhu," fig. 52) on the pile of excavated sand. Although disclaiming any knowledge of connection between this figure and the contents of the shrine, he gave reason to believe there was some meaning not yet discovered. The same symbol was found by Mindeleff on a wall of Casa Grande (see pl. 40).

The collection of stones from this shrine is among the most remarkable the writer has ever seen, being equaled only by the contents of certain shrines of the Hopi. Most of these stones had been brought from a distance; they consist of bowlders and pebbles from the Gila, twisted and contorted fragments of lava, petrified wood, and objects of sandstone and other rocks, botryoidal in form. There are also pigments of various colors—green copper ore, white kaolin, and black shale, with fragments of red iron oxide.

The general appearance of Compound B after excavation leads to the belief that it contained fewer massive-walled buildings than Compound A, and that the number of more perishable habitations was much larger.

The character of the mounds of Compound B and the evidence of great erosion (greater than in Compound A) they exhibit suggest considerable age, an idea confirmed by the superposed strata of floors and the subterranean walls and "pit-rooms" under the boundary walls. Compound B is believed to be much older than Compound A, but whether it was abandoned before the latter was erected is a question which can not be answered. The age of Compound B as compared with that of the other compounds is also hypothetic; few data remain that can be used in such comparisons.[2]

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[1] These objects are described on pp. 120, 121. The significance to be attached to these stones is not quite clear, but the custom of collecting different forms in an inclosure is recorded from many pueblo ruins and still survives in several modern pueblos. In searching for an explanation of their significance the mind naturally ascribes to the Casa Grande shrines and their contents the same meaning as to the pueblo counterparts, but similar collections of odd-shaped stones having other meanings attached thereto are widespread among prehistoric peoples.

[2] The two compounds, A and B, with Clan-house 1 (pls. 11, 12, 27, 44), were modeled by Mr. H. W. Hendley, of the U. S. National Museum, under the writer's direction, for the Alaska-Yukon-Pacific Exposition, at Seattle. These models, now in the National Museum, illustrate more graphically than can any descriptions the resemblances and differences between these structures.

SUBTERRANEAN ROOMS

Subterranean rooms were found near the northeast corner of Compound B, apparently filling the whole of that section. The best-preserved of these (pls. 29; 41, *b*, *c*) lies directly under the east wall, which passes over it at an angle. It seemed important to protect this room by erecting a roof over it, as shown in plates 29; 41, *c*. The position of the wall, of the floor beneath, and of the fireplace several feet below it and the level of the plain, indicates that these subterranean structures were made before the wall of the compound was constructed (pl. 41, *c*).

The presence of subterranean rooms under the walls of Compound B proves that the people of this region lived in pit-dwellings on that site before they constructed the wall. This fact points to a belief that the pit-dwelling is the oldest form, and if so search for the kin of the original inhabitants of the Gila-Salt Valleys may be made among those dwelling in similar habitations. Taken in connection with the existence of cremation, this clue serves to direct attention to California tribes, thus adding weight to a legend that the prehistoric peopling of southern Arizona was by migration by way of the mouth of the Gila.

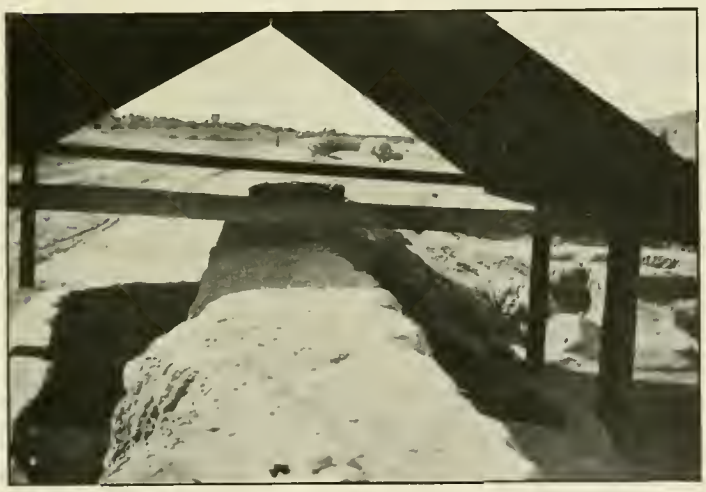
COMPOUND C

Compound C, situated due west of B, is, on account of its moderate height, the least conspicuous of all the compounds. As there are no mounds within the inclosure it seems never to have had extensive buildings, but to have been merely a rectangular area surrounded by a wall, in which was clustered a large number of fragile-walled rooms that once served for dwellings but are now destroyed. (Fig. 14.) The outside dimensions of the compound are not far from 300 feet long by 40 feet wide, and the surrounding wall in places was 4 feet in thickness and probably breast high. There appears to have been a gateway about midway in the west side, and at the northwest corner was once an opening of considerable size. The shape of the compound is not perfectly rectangular, the whole northern portion having been much more eroded by the elements than the southern end. In the southern section still remain fragments of walls, some of which were a part of buildings of considerable size, possibly of communal nature. Most of the walls of buildings in Compound C were supported by upright posts, the stumps of some of which still remain, notwithstanding the walls themselves have fallen. In the southeast corner rose a small square tower, or lookout, the foundations of which are well preserved, although the portion of the walls above ground is entirely destroyed.

The greater part of Compound C was covered with rows of houses, the floors and fragments of the walls of which, although present in

a, NORTHEAST CORNER

b, WALLS OF SUBTERRANEAN ROOM, NORTHEAST CORNER



c, EAST WALL AND ROOF OVER SUBTERRANEAN ROOM

SUBTERRANEAN ROOMS AND CLAY-PITS

several places, are now very much dilapidated. All the evidence indicates that this compound was of much later construction than Compounds A and B and that it was not inhabited long enough to have temples or specialized rooms for ceremonial purposes.

Not far from the west side of this compound can be traced for a considerable distance the remains of an irrigating ditch, which extends from the Gila to a point west of the Casa Grande Group of ruins. This ditch entered the Gila at a point higher up, about 3 miles from the ruin.

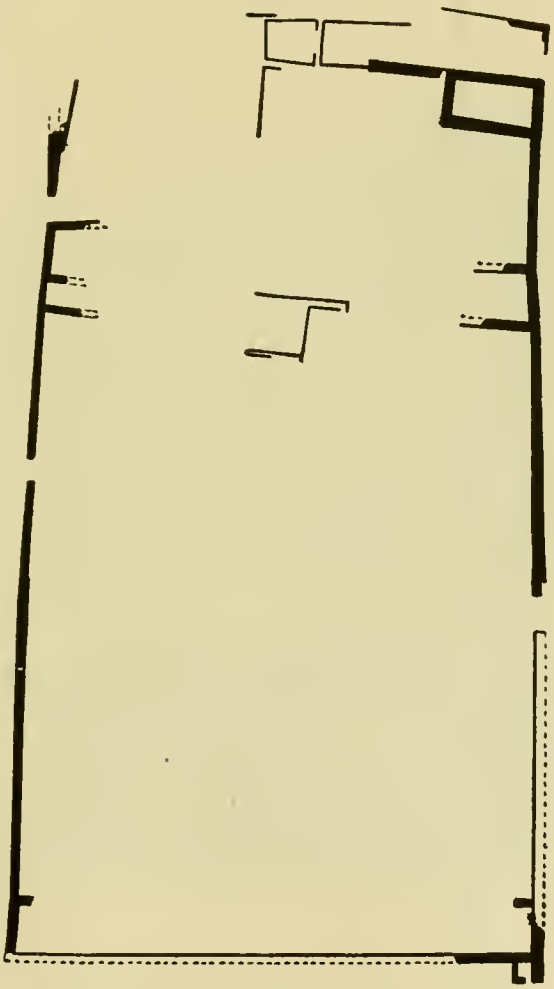


FIG. 14. Ground plan of Compound C.

Near this compound, averaging about 20 feet distance from the surrounding walls, is a succession of low mounds resembling the refuse-heaps found in the vicinity of the other compounds. From the numerous fragments of pottery that are found on them, it may be inferred that some of these mounds were perhaps places where pottery was fired; others of circular shape show on their surface charcoal and wood ashes. These elevations may possibly have been used in some instances for the cremation of human bodies. Excavations in mounds of this kind revealed alternate layers of charcoal and ashes, with drifted sand deposited upon each. From the relatively large number of pottery fragments and stone implements in this mound it appears that the place was formerly inhabited by a large number of persons. The inclosing wall served as a protection for the buildings within it that have long since fallen.

Compound D

Compound D (fig. 15), which is situated about the same distance east of Compound B as is Compound C in the opposite direction, is

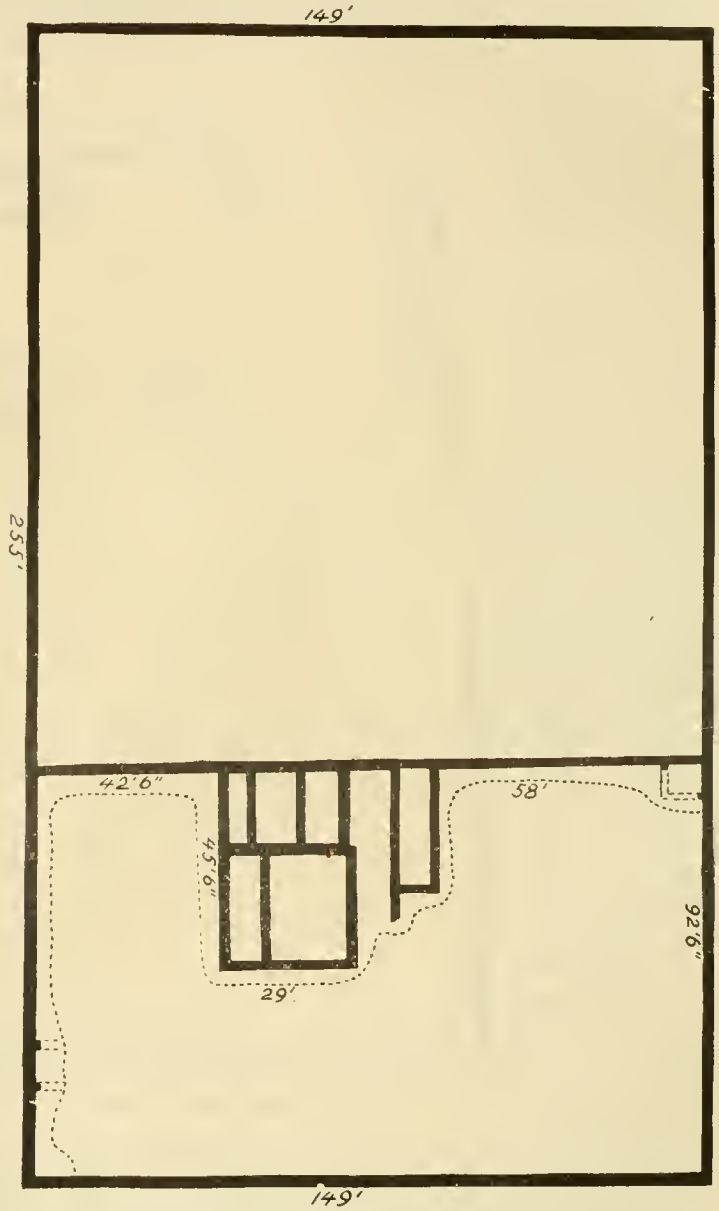


Fig. 15. Ground plan of Compound D.

rectangular in shape and oriented about north and south, as are other Casa Grande compounds. It was of apparently the same general

character as the others, containing a massive building centrally placed, the walls of which have been greatly eroded by the elements.

Within the surrounding wall were also numerous rooms whose fragile walls have fallen, burying their floors two or three feet below the surface. At the periphery of one of the floors a row of holes in which upright posts formerly stood could readily be traced, showing that the room was rectangular in form and had a doorway on one side. The fireplace, a round depression in the floor just in front of the doorway, still contained ashes. The conditions here are similar to those in Compound B. The massive-walled buildings doubtless served as granaries or possibly were devoted to religious purposes; the fragile-walled structures were the dwellings of the people. The eroded appearance of this compound suggests great age, stamping it as one of the oldest of the Casa Grande Group.

FIG. 16. Hand-prints and eroded base of wall of house in Compound D.

In the character of the masonry the massive-walled buildings of Compound D closely resemble those elsewhere described. They are not as high as the corresponding structures of Compounds A and B, having been greatly weathered. The surrounding wall was low, in no place above the surface of the ground, and its course could not be traced by excavation. The central building was apparently connected by a wall with one side of the wall of the compound.

On the plastering of one of these buildings are black impressions of human hands (fig. 16). The rooms were excavated to their floors, but no objects of importance were found.

Compounds E and F

Remnants of large walls identified as boundaries of several other compounds were traced at various places in the reservation, the most conspicuous being those of Compounds E and F, which could be followed for a considerable distance west of Compound A. These inclose low white mounds, sparsely covered with mesquite and other growth, which seem to contain the remains of massive buildings, the walls of which have fallen or have been worn down by rains to a level with the plain.[1] In this vicinity there are numerous other low mounds without walls which bear outward resemblance to refuse-piles.

No excavations were made in these mounds, although there is evidence that some of them would repay examination. The presence of fragments of pottery, and broken stone objects, apparently worked by hand, suggests sites of many former habitations.

Clan-house 1

In addition to the compounds, or structures inclosed by a common wall, there is a type of thick-walled buildings at Casa Grande from which this wall is absent or at least has not yet been discovered. The best example of this type is the so-called Clan-house 1 (pls. 43, 44), one of the most striking group of rooms excavated during the writer's field work in the second year.

Clan-house 1 is 740 feet due east of Compound A. The group of rooms brought to light by excavation possibly belonged to a large compound the boundary walls of which had been practically buried or totally destroyed. When work on Clan-house 1 began, two ash-colored treeless mounds rising a few feet above the level of the plain were all that was visible, the space between the mounds being covered with scattered trees, bushes, and cacti. The results of the excavation appear in the accompanying plan (fig. 17), in the bird's-eye view (pl. 43), and in the illustration of the model (pl. 44).

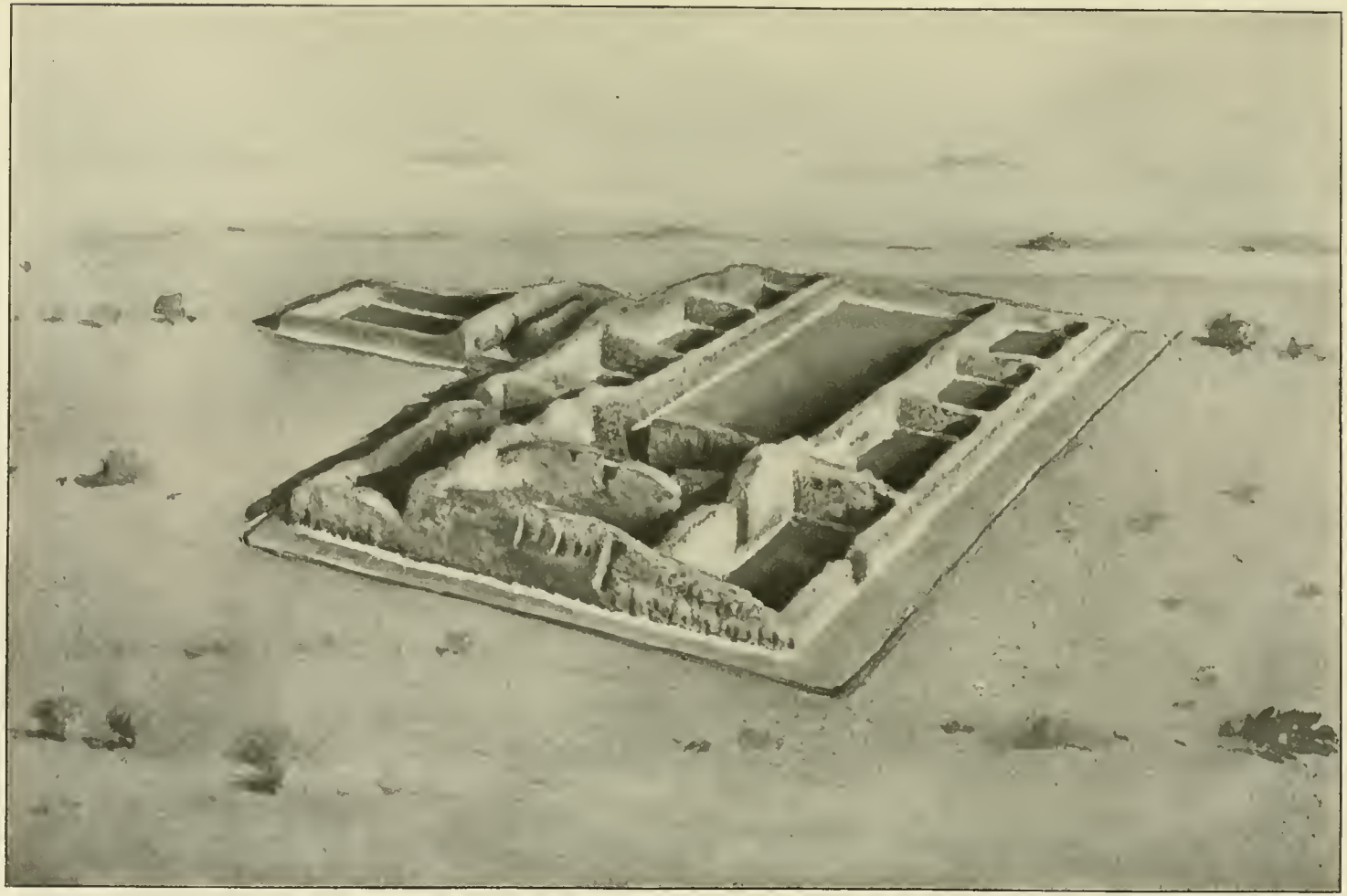
Clan-house 1 has 11 rooms (A–J, M, fig. 18) inclosing a plaza, its outside measurements, exclusive of the annex (L, K), being 113 feet long and 49 feet wide. The longer walls extend east and west, instead of north and south as in the compounds. In addition to the 11 rooms which form the main portion of the structures excavated, there are three low-walled rooms on the east side, which we may call the annex; one of the main purposes of this structure was to contain the grave (fig. 18) of the former chief, possibly the owner of the whole building. From various circumstances it is believed that the walls of this annex were built later than the remainder. The walls of Clan-house 1 are massive (pl. 45), averaging 4 feet in thickness; the altitude of the highest is 10 feet. As shown in

[1] The appearance of the tops of walls of Gila ruins, before excavation, is shown in plate 42.

APPEARANCE OF COMPOUND-WALLS BEFORE EXCAVATION

The courses of the walls may be traced by the white "paths" on the surface, which are practically devoid of vegetation.

BIRD'S-EYE VIEW OF CLAN-HOUSE 1, FROM THE NORTHEAST



(From photograph of model by Hendley)

BIRD'S-EYE VIEW OF CLAN-HOUSE 1, FROM THE SOUTHWEST

a, FROM THE EAST

b, FROM THE SOUTH

CLAN-HOUSE 1

broken sections, these walls were supported in part by upright logs (pls. 44, 45), but were constructed of huge cubes of rammed natural cement, in the same way as the walls of Casa Grande. The arrangement of the 11 rooms composing Clan-house 1 is as follows: On both the north and south sides there is a row of rooms the breadth of which is about uniform, while the length varies; the room at the east end of each series is the largest. There are five rooms (F–J) in the series on the north and four (A–D) in the series on the south. To the west of the plaza, between these rooms and connecting them on this end, are two rooms (E, M), which have the highest walls and were apparently the most important rooms in Clan-house 1. These rooms occupy

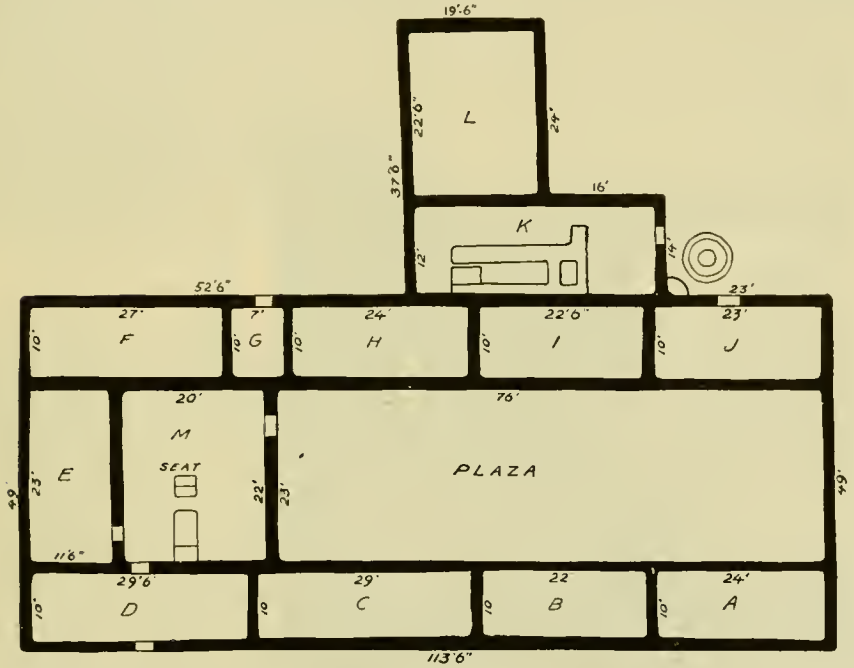


FIG. 17. Ground plan of Clan-house 1.

about half of the space between the north and south series of rooms, the remaining area consisting of a plaza, or open space, having an entrance from the room on the west side. The several rooms in the series on the north side (F–J) do not communicate, nor have they external passageways except in two instances (G, J); also, room D in the southwest corner communicates with a large room (M) at the west end of the plaza. In the middle of the centrally placed (M) of the 11 rooms above mentioned was found a seat (figs. 19, 20) facing the south, made of a great block of natural cement.

It is suggested that Clan-house 1 was a structure similar to Casa Grande proper and pertained to the worship of the six primary

points—north, west, south, east, above, and below. It is an interesting fact that the number of rooms in Clan-house 1, excepting the annex, is exactly the same as in Casa Grande. In the former, however, the 11 rooms are one story in height, whereas in Casa Grande there were five rooms in each of two lower stories and one room in a third.

Perhaps the most remarkable of the several rooms in Clan-house 1 are the two massive-walled inclosures (K, L) on the north side, which have been designated "the annex" (pl. 46). One of these (K) seems to have been merely an open space surrounded by thick walls formerly higher than at present. In this inclosure were found the remains of a walled-up cyst of natural cement, one side of which was built continuous with the south wall; the other sides of this cyst, visible from the room, were decorated with figures of birds and other animals, painted red.

FIG. 18. Sarcophagus in room K of annex to Clan-house 1.

In the interior of this cyst, or rude sarcophagus (fig. 18), was found a human skeleton extended at full length with the head directed to the east; near the head was a receptacle for mortuary offerings. From the nature of the objects associated with this skeleton and the special receptacle apparently made for them, it is supposed that the remains were those of an old priest, possibly of a chief, who once occupied these rooms. The mortuary objects are figured and described later (see pp. 124, 127, 130) and their special significance, so far as can now be determined, is discussed. They appear to be priestly paraphernalia, similar to those now used in ceremonies by priests of the Pueblo

a, FROM THE NORTHEAST

b, NORTHWEST CORNER

ANNEX TO CLAN-HOUSE 1

Indians. All the facts gathered show that this burial chamber was built after the main building was constructed, but its age, as compared with that of the other compounds, is unknown. In the sand outside the walls were found one or two clay vessels containing burnt human bones, covered with clay disks, which are supposed to be the partially cremated remains of inhabitants of this building. The two methods

FIG. 19. Seat in room M, Clan-house 1, looking northeast.

of disposal of the dead—inhumation and cremation—were practised in all the compounds of Casa Grande.[1]

It is sometimes stated that the priests of the Gila compounds were always buried in houses while the less-favored classes were cremated, their calcined bones being deposited in cinerary urns or vases that later were buried on the borders of the mounds where they had been committed to the flames. While not able to prove or disprove this theory,

[1] At the present day the Pima bury their dead, and the graves of the shamans are different from those of other people. The custom of burning the dead does not now exist among these people.

it is believed that the grave of the chief of Clan-house 1 has an important bearing on this question. Here, as stated, a man was found buried with care in a rude sarcophagus evidently constructed for the purpose. This is the only example known to the writer of an intramural grave of this character, although other burials within house inclosures have been found, namely, in the floors of one of the rooms

FIG. 20. Seat in room M, Clan-house 1, looking southwest.

of the block in the southwest corner of Compound A. A human skeleton was also excavated from the plaza west of the northeast building of the same compound, at the point marked "skeleton" in the ground plan (pl. 6) of that compound.[1]

[1] The writer is inclined to regard this burial as having been made long after the abandonment of the compound, and the same may be true of the "Eagle burial" also, near the northwest angle of Font's room. Near the latter, however, were found fragments of decayed posts, as if part of the corral in which the eagle had been confined. The ends of these posts were inserted in holes below the general level of the plaza.

Refuse-heaps

The large structures, especially compounds A, B, and C, are surrounded by refuse-heaps, the surfaces of which are strewn in some cases sparingly, in others plentifully, with fragments of pottery and with ashes and other evidences of human occupancy. No remains of house walls were found in these mounds and their structure shows that they may be regarded as dumping places for the habitations in the vicinity. Some of these heaps were thrown up from neighboring depressions, or reservoirs, and their stratification indicates that layers of earth were deposited on them at different times. A vertical section exhibits beds of ashes and other refuse alternating with sand and soil, showing how the mounds increased in size.[1]

Distinct from these are the small mounds or elevations, rising a foot or two above the plain, that likewise mark man's presence. These mounds indicate the former existence of dwellings in the open, and it is reasonable to suppose that outside the compounds, especially along the irrigation ditches, there were isolated dwellings somewhat resembling the modern Pima houses. While these may have been shelters used by farmers only while planting or watching their crops, they show that the country around the compounds had its quota of inhabitants. Within and near the compounds these houses may have been very numerous, so closely arranged as to give the appearance of a village, in the middle of which rose the great communal structure that served as a place of refuge in great emergencies or for ceremonies when desired.

A mound situated a short distance east of Compound B was excavated to the depth of 9 feet. Trenches were dug across it at right angles, bisecting the mound east and west, north and south. This mound was found to contain fragments of pottery, sticks, charcoal, and other refuse; also the remains of several skeletons, extended at length, the skulls of one or two being in fairly good condition. It thus appears that the inhabitants of Casa Grande buried some of their dead in mounds and others in the floors of houses and plazas. As will presently appear, they also cremated the dead here as elsewhere in the Gila and Salt River Valleys.

Reservoirs

It has been already mentioned that, scattered over the area occupied by the Casa Grande Group of ruins, there are several depressions into which drains from the compounds have been run. The largest and deepest of these is found northeast of Compound B. These depressions, which have no masonry walls, appear to be the places

[1] One of the largest of these refuse-heaps lies between Compound A and Clan-house I, nearer the former. This mound, which extends about parallel with the east wall of Compound A, contains many fragments of pottery.

from which was obtained the caliche of which the buildings are made. One or two of the depressions are so situated with respect to the largest buildings that the adobe of which the houses were built may have been carried at times a considerable distance.

Similar areas inclosed by artificial circular ridges of earth are found in several of the clusters of mounds in the Gila and Salt River Valleys, among which may be mentioned the one in the group near Adamsville and the reservoir at Casa Blanca. The Escalante Group, situated near the Phoenix-Florence Railroad, also contains a similar reservoir. In the country south of the Southern Pacific Railroad, inhabited by a group of Indians of Piman stock called the Quahatika (Kwahadt), similarly shaped depressions are recorded, some of which are still used as reservoirs at certain seasons. This is likewise true of so-called Indian tanks (Pima, *vashki*), to the east of Casa Grande, near the Santa Catalina Mountains, and elsewhere (pl. 38).

Certain areas marked by no mounds or depressions may have served as race courses or dance places, the existence of which is mentioned in legendary accounts of Casa Grande.

On the southwest side of the large reservoir is a depression from which were obtained the sand and earth out of which walls were made, and a similar depression on the east side may have been due to a similar cause. There are depressions in the surface near Clan-house 1 and Compound D, and those near the western clan-houses[1] served the same purpose.

From remains of ancient irrigating ditches in the neighborhood of the several compounds it is evident that water from the Gila River was conducted over the plain west of Casa Grande. Here and there, especially near the large mounds, occur numerous depressions in the earth's surface, some of which are possibly reservoirs, or places where the water was stored for irrigation, drinking, and other purposes. Most of these depressions are surrounded by a ridge of earth, by which their capacity was increased and the chance of overflow diminished. Their prevailing shape is oval. The indications are that they have been filled to a considerable extent with drifting sand since Casa Grande was deserted.[2] The largest is situated about midway of a line extending from the northwest corner of Compound A to the southeast corner of Compound C. It was supposed that this reservoir was lined with a cement wall, but a section exposed through the rim on the south side, which was solid sand throughout, revealed no such condition. It is interesting to note that the floor of this reservoir is now thickly overgrown with trees and bushes, although without water.

[1] There are mounds west of Compound A, which are here referred to as "western clan-houses," but these were not excavated, although traces of caliche walls were found in them. Potsherds were abundant.

[2] Many of the *casas grandes* in the Gila-Salt region have similar reservoirs, or circular depressions with raised rims. Cushing's excavation of one of these depressions convinced him that it was not a reservoir but a ceremonial chamber.

At one end of this reservoir may still be seen a trail along which the women toiled with water jars from their dwellings near by. The shapes of the water jars and certain head-rests that have been found indicate that the vessels were carried on the head, as at Zuñi, rather than on the back as at the Hopi pueblos. There is strong evidence that the people of Casa Grande were well supplied with water by means of reservoirs and irrigation ditches. This need was not so pressing as in northern Arizona. It does not appear from symbolism on the pottery or from other evidences, which it must be confessed are scanty, that rain ceremonies occupied the prominent place in the worship of the inhabitants that they do among the present Pueblos. The people depended for water less on rain than on the Gila; the river was typified by the plumed serpent, which was worshipped.

There are indications of small mounds in the neighborhood of these reservoirs, a fact from which it would seem that every reservoir had a cluster of habitations around it and that houses were built along the courses of the irrigation ditches. Nothing now remains to mark these houses except the mounds upon which are found fragments of pottery and broken stone implements, including now and then a well-worn metate. Excavation of one of these mounds revealed a hardened floor surrounded by holes in which are found decayed stumps of the posts that formerly supported the walls. The resemblance of these houses to those now built by the Pima and Papago Indians is striking. They resemble also the remains of rooms of the ancient people in the various compounds of Casa Grande.

Irrigation Ditches

The evidences of prehistoric irrigation in the neighborhood of Casa Grande are many, but it is difficult to trace any ditch very far. The main canal which supplied the fields with water extended along the left bank of the river, from a point 3 miles higher up; this was probably provided with lateral ditches along its entire length. It approached Casa Grande about midway between Compound B and the river, on the north side of the compound, and, extending westward, turned to the south, sending off smaller branches toward the east and west. Although the main ditch can not be traced throughout its entire course, traces of it appear at intervals; in some places it is clearly marked by walls of earth containing small stones similar to those found in stretches of its bed nearer the river. In places the canal is 20 feet wide, adequate for carrying a great amount of water.

The construction of the Casa Grande ditch was not difficult, as the earth is not hard to dig and no considerable elevation was encoun-

tered throughout its entire course. The canal divided probably shortly after it left the river, sending a branch that runs east of Clan-house 1 to supply the fields on the east side of the compounds. From the point of bifurcation the remains of a smaller canal can be traced for some distance.

As above stated there is evidence that buildings once stood on the banks of these ditches, where their former presence is now indicated by low mounds on which are scattered fragments of pottery and a few broken stone implements (metates, or grinders). Irrigation ditches are more apparent elsewhere in the Gila and Salt River Valleys than at Casa Grande. The settlement near Poston Butte was supplied with water by one of the best-preserved of these ancient ditches in the Gila-Salt Valley. This follows the right bank of the Gila from a point several miles higher up the river and extends to the neighborhood of the Escalante ruin, where it is lost in laterals or minor branches. Near Poston Butte, the southern side of which it skirts, the banks of this prehistoric ditch are head high and can be traced for many hundred feet without difficulty. The writer has been informed by an old Mexican who lives in Florence that when a boy he saw stumps of old logs in this ditch at the point where the banks are highest; he believes these were remains of a prehistoric head-gate.

In the following quotation H. C. Hodge refers to a prehistoric irrigation ditch on the north side of the Gila near Poston Butte:[1]

> About 2 miles west of Florence, on the north side of the river, between the homes of Mr. Stiles and Mr. Long, is a stretch of hard, stony land, through which another of the large irrigating canals was cut, and where, for several hundred yards, one can ride on horseback in the canal, which is yet so deep one can not look over its banks on either side, when sitting on his horse.

Some of the best irrigating ditches in the Gila-Salt Valley were found near Phoenix and Mesa when the country was first entered by Americans. That near Mesa was utilized by the Mormon farmers who settled this region; others have been filled or destroyed by modern agriculture. The lines of many of the new ditches follow substantially the lines of the prehistoric canals, showing the skill of the primitive farmers. The irrigation ditches in the neighborhood of Phoenix have been traced and mapped by Mr. H. R. Patrick,[2] under whose guidance the writer has visited certain remains still visible near that city. These can now be traced only at intervals, and in many instances nothing remains but ridges of earth or rows of stones.

It appears from Mr. F. H. Cushing's studies of the irrigation ditches[3] near the ruins of Los Muertos in the Salt River Valley that some

[1] Arizona As It Is; or, The Coming Country, p. 182, Boston, 1877.
[2] The Ancient Canal Systems and Pueblos of the Salt River Valley, Arizona, Phoenix, Ariz., 1903.
[3] See F. W. Hodge, in *American Anthropologist*, VI, 323, Washington, 1893.

parts of these were well-preserved. The existence of a narrower channel in the bed of a large ditch, through which the water could run when the supply was small, was seen elsewhere by the present writer. The main ditches were large enough for irrigation when full of water and doubtless were used for that purpose. Not far from Blackwater is a hill, surrounded by a prehistoric ditch above the level of the plain, around which the ditch was dug to avoid a too rapid descent.

The testimony of the old men consulted supports the theory that the ancient irrigation ditches were dug by means of wooden shovels similar to those mentioned and figured later in this report, the earth probably being carried to a distance by the women and children. The present Pima say that they now organize to construct irrigation ditches in a way somewhat similar to that of the ancients. As all clans enjoy the advantage of the water thus obtained, every clan has its representatives in constructing the canals, and failure to work involves loss of water right, although a clan may be represented by members of other clans. The amount of labor necessary in the construction of new ditches is settled in council, in which all clans interested take part.

The construction by the ancients of the great irrigation ditches led to greater cooperation of labor in the Gila-Salt Valley than anywhere else in the prehistoric Southwest. This union of many men under a chief, with equal representation in council, led to an advanced social organization and culture, a degree of culture which would not have been realized so soon under less favorable conditions. This cooperation and resultant organization made possible also the building of the great compounds and the massive structures they inclosed.

Excavation of one of the banks of an irrigation ditch near Casa Grande shows successive layers of soil and small stones, indicating repeated clearing out of the canal. The layers of stone may have been necessary to prevent the earth washing into the channels. These were also continually filling up with mud and detritus from the river, the amount of which was considerable when the Gila was swollen. The head-gates were probably made of posts and brush, not unlike the gates constructed at the present day by the Pima and the Maricopa.

Closely connected with the irrigation ditches are the reservoirs (*vashki*), of which there are one or more near every large group of compounds in the Gila-Salt Basin. These reservoirs are shallow depressions in which rain water collects, but were not always connected with the irrigation ditches. Drinking water was probably obtained from these and other receptacles.

Mescal Pits

Scattered at intervals over the reservation, not far from the compounds, but never within them, one finds here and there circles of blackened soil, the surfaces of most of which are on a level with, or slightly depressed below, the surrounding plain. No considerable quantity of vegetation of any kind flourishes within these circles, and examination of the soil reveals the existence of charcoal and other evidences of fire. One of the circular areas was dug into and as excavation progressed the effects of fire became more apparent, until at a depth of about 5 feet there was found a number of stones affected by fire in a marked degree. Below these stones was a layer of cinders and charcoal resting on a surface made of clay well tramped down. The evidence of the action of fire on this floor is unmistakable. The clay walls of these pits also show the effect of intense heat. It is evident from excavations that these pits are similar to those still constructed by the Quahatika (Kwahadt) for roasting the tender leaves of the agave.[1] The method of using these pits is as follows: Great fires are first kindled in them, after which heated stones are thrown in; on these stones are laid agave leaves, sometimes to a depth of 2 or 3 feet. Fire is kindled over this accumulation and by action of the heat below and above, the leaves are roasted without being burnt. The number of these large pits found indicates that mescal was a favorite food with the people of Casa Grande, each compound seemingly having had its own mescal ovens.

One of these pits was thoroughly dug out and the burnt stones were removed; they were then carefully replaced in their former position. The broken wall of the depression was made of clay burnt in place. This was carefully repaired, showing the type form of these structures. One of the best examples of a mescal pit is situated close to the road to Casa Grande station, not far from the southwest corner of Compound A, and can readily be seen from a wagon by one approaching the ruin from the south. Most of the mescal pits were found south and east of the compounds. It can hardly be possible that the pits were placed so that the smoke would give the least trouble to the inhabitants of the houses, as that consideration is rarely taken into account by Indians. Probably it was more convenient to place them on the sides where they were found in greater numbers.[2]

[1] Similar ancient mescal pits are found at the ruins near Tempe, Mesa, Phoenix, and elsewhere in the Salt and Gila Valleys.

[2] It is instructive to note *en passant* that the greater erosion in the walls of the large blocks of buildings of Compound A is on the east side. This side of Font's room was so worn down that the east wall was level with the ground. All the east walls of the southwest building were much eroded and the corresponding wall of the historic Casa Grande ruin is more eroded than is the northwest or the south wall. This unequal wearing of the walls is ascribed to the rain beating on the east side. Possibly the buildings were terraced toward the east for priests engaged in sun worship.

Methods of Disposal of the Dead

Considering the large population that must have lived at Casa Grande, it is strange that in all the writer's excavations so few human skeletons were found. There is evidence of two kinds of burial, inhumation in houses and mounds, and cremation, an instance of which was discovered not far from the north wall of Compound B.[1]

Whether or not this difference in the manner of disposal of the dead was due to the rank of the deceased is not clearly evident, but the nature of the objects buried with a skeleton in Clan-house 1 would seem to indicate the grave of a priest. Skeletons unaccompanied by mortuary objects were found in the plazas of Compound A and in rooms of the southwest angle, but whether these are ancient or modern is not positively known.

The absence, so far as known, of evidences of cremation from the cemeteries of the Little Colorado region, including those of Zuñi, and of Sikyatki, Awatobi, and other Hopi ruins, has been used as an argument against associating the former inhabitants of these pueblos with the Hohokam of the Gila-Salt Basin. Moreover, the Pima do not burn their dead, nor have they done so in historic times. It may be said in reply to this objection that the Hohokam inhumated as well as cremated, thus furnishing a double precedent for their descendants. Moreover, there is good evidence that cremation was practiced in the eastern and northern Pueblo region, at Mesa Verde for instance. According to Castañeda, the Cibolans[2] burned their dead.

The human bodies buried in the earth at Casa Grande were laid at full length, no remains of an inhumated body in a flexed position having been found. It is usual to find in pueblos and cliff-dwellings[3] skeletons buried in both ways. The manner of interment may have had in some cases an esoteric meaning, but in most instances it had no special significance.

Several theories have been suggested to account for burial in the contracted position. It has been asserted by some authorities that the corpse was so disposed to represent the embryonic position. According to a second theory the body was deposited in the squatting position as suggestive of a state of rest.

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[1] It would appear that a people who burned their dead did not believe in a resurrection of the body, and the same may be true of those who buried their dead. The placing of offerings in the grave indicates faith in the continuation of life, but does not prove, of course, belief in immortality. The practice of burning the dead, which was widespread in the Southwest in prehistoric times, was abandoned when the teachings of the missionaries were followed.

[2] Cibola is identified by the best authorities as ancient Zuñi, but no evidence of cremation has yet been found in Zuñi ruins.

[3] A cliff-dwelling is practically a pueblo built in a cave, and what is true of one probably holds true for the other, with slight modification.

It has been pointed out also that a body in the contracted position can be more readily carried on the back, than when it is extended. In house burials, in which the bodies were carried only a short distance, they were commonly laid on the side in the extended position, perhaps in the same position as at death.[1]

As a rule, the few bodies uncovered from mounds by the writer were extended at full length, but one or two had the knees brought to the chest (contracted position), as is common among many Indian tribes. Mortuary offerings were found with most of the skeletons.

It is believed that cremation is the oldest and most general manner of disposal of the dead and that it was formerly widespread in the Pueblo area. Even when cremation and inhumation coexist, it is possible that one of these practices may have been introduced much later than the other. They may also suggest the existence of a former dual sociologic composition.

The interments found near Compound B were in several instances about 9 feet below the surface. Other human skeletons, however, were found just below the surface.

In the cases in which human remains were cremated the calcined bones and ashes were placed in ollas or vases[2] over which were luted circular clay or stone disks.

MINOR ANTIQUITIES

The two seasons excavations at Casa Grande revealed instructive objects, some of which shed light on the former culture of the people of this valley; but considering the amount of earth removed in that time, comparatively few objects were found. This may be due to the fact that no cemeteries were discovered and hence the number of mortuary objects was small.

The collections consist of objects of stone, clay, shell, bone, and wood, and fabrics of various kinds, including cloth, string, and netting. The stone and clay objects, being the least perishable, are naturally the most numerous.

Similar specimens found in many of the ruins in the Gila and Salt River Valleys exist in a number of museums and private collections,

[1] The Hopi now bury in the contracted position, and it is customary for the oldest male relative to carry the body down the mesa side on his back and deposit it in the sand at the base of the foothills. House burials among modern Hopi have long since ceased, but when Sikyatki and Awatobi were in their prime they were not uncommon.

Among the modern Pima the graves of medicine-men are apart from cemeteries, and have a somewhat different character, as described by Doctor Russell. It is instructive to note that the body of a medicine-man is said to be placed in a sitting posture, while the Pima generally now bury the body extended. Such shaman burials are not common and by this time may have been wholly abandoned, since through the zeal of missionaries and other teachers the Pima are practically no longer pagans. Still, the survival into the present generation of two forms of inhumation is noteworthy.

[2] Similar vases with calcined human bones have been found along the San Pedro and throughout the Pueblo Viejo Valley, especially in association with the ruin at San José.

but few of these came from Casa Grande. These collections embrace many types not found at Casa Grande and many beautiful specimens illustrating the same types as those referred to in this report. It is only necessary to refer to the magnificent material in the Peabody Museum, Cambridge, collected at Los Muertos and elsewhere in the Salt River Valley, by the Hemenway Southwestern Expedition under Mr. F. H. Cushing, and to the private collections made at Phoenix, Arizona, by the late Doctor Miller.

Mr. Benham formerly had installed in his shop at Phoenix a fine collection of Gila Valley antiquities, containing specimens owned by several persons.

Some of the objects above mentioned have been described by other archeologists,[1] but it may be said that there is no comprehensive account of the antiquities of the Gila-Salt area. Although the present article will not supply this deficiency, it is the intention to include in it all objects found by Government officers at Casa Grande and now deposited in the National Museum at Washington.

A list of these specimens with brief notices and measurements of most of them is appended to this report. As will be seen by consulting this list, more than 1,300 objects have been obtained and cataloged. It is unnecessary to do more than to refer to the more striking of these, but there are added notices of one or two objects from neighboring ruins, and of a few collected at Casa Grande before the writer's excavations began.

Mindeleff Collection

The specimens deposited in the National Museum as the result of the repair work in 1891, referred to in Mindeleff's report,[2] are as follows:

National Museum number	Bureau of Ethnology number	Article	Number of specimens	Remarks
155088	595	Fragments of large earthenware vessel	Lot.	Plain red on both sides.
155089	596	Large bowl	1	Red outside; black, polished inside; stored.
155090	597	Large vase	1	Decorated outside; restored.
155091	598	Pottery fragments	14	Decorated.
155092	599	Pottery vase (toy)	1	Small, dark brown.
155093	600	Pottery bowl (toy)	1	Small, black.
155094	601	Pottery disk or spindle	4	

[1] Mr. Warren K. Moorehead has figured and mentioned in his "Stone Age" and other writings many instructive archeologic objects found by him near Phoenix, Mesa, and Tempe.

[2] The Repair of Casa Grande Ruin, Arizona, in 1891 (*Fifteenth Ann. Rep. Bur. Amer. Ethnol., 1897*). This report, as its title indicates, deals with the details of the repair of the ruin, and likewise of excavations that were found necessary; it contains also a short description of the ruin as it was in 1891. Several good views, reprinted from a former report, are introduced. In the course of the excavations made in preparation for the repair of the ruin at that time, a portion of the east wall near the south corner fell, and the connection of the six ceremonial rooms with the main building was destroyed.

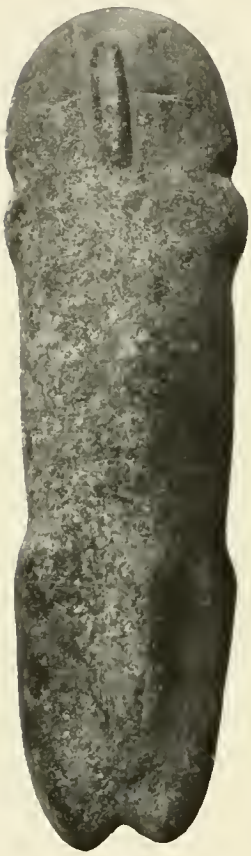
National Museum number	Bureau of Ethnology number	Article	Number of specimens	Remarks
155095	602	Pottery toy (mountain goat)	1	Dark brown.
	603	Adobe	2	Lumps; 1 showing impression of cloth, the other of a human foot.
	604	Small shells	Lot.	
	605	Small shells	Lot.	
	606	Small shells (Conus)	Lot.	
	607	Small shells (cut and perforated)	Lot.	For use as pendants.
	608	Small shells, beads, and pendants	Lot.	1 string and 2 fragments.
	609	Bone awls	3	
	610	Bone fragments	6	Partly charred.
	611	Chalk, obsidian chips, and brown adobe	Lot.	
	612	Charred wood, 2 nuts, and a corncob	4	
	613	Charred textiles, cloth	2	
	614	Wooden-joist fragments	3	3, 6, and 9 inches long; 4 inches diameter.
	615	Reed	1	12 inches long.
	616	Stone axes	7	And 3 broken, grooved.
	617	Pounding-stone and fragment	2	Of sandstone, with ring-shape handle.
	618	Stone pestles	2	One 12½ inches long, 1¾ inches diameter; one 9½ inches long, 1¾ inches diameter; also a fragment.
	619	Stone mullers	4	
	620	Stone hammers	6	1 pitted.
	621	Stone mullers, flat	6	5 broken.
	622	Stone mortar, flat	1	6½ by 12 inches; 2 inches thick.
	623	Stone mortar	1	13 by 22 inches; 6 inches thick.
	624	Stone, polished	1	22 inches long; 6½ inches diameter restored.
	625	Stone hoes or chopping knives	2	
	626	Limestone ornament	1	Carved, fragmentary.
	627	Small stone vessel	1	Serpent carved on the outside.
	628	Stone arrowheads	2	1 of obsidian, very small, and 1 of flint; also a broken specimen.

Pinckley Collection

Mr. Frank Pinckley, the present custodian of Casa Grande, has made a valuable collection, now installed at the ruin, which can be inspected by visitors.[1]

It is to be hoped that a museum for Casa Grande antiquities may be erected l ter near the ruin and that in it may be placed not only all specime s gathered from the reservation and its neighborhood, but also such books, maps, and other materials as pertain to the ruin, in order to increase the educational value of this example of the culture of the former people of the Gila Valley.

[1] The writer has seen in private hands one or two specimens which their owners claim were found at Casa Grande. In view of the fact that there is doubt as to the provenance of some of these objects, and as they are in no way exceptional, it is thought best not to include a description of them in this report.



(No. 254457)

IN HUMAN FORM

(No. 254458)

FROG-SHAPED

STONE IDOLS

COILED SERPENT (No. 251678)

UNKNOWN ANIMAL (No. 254422)

BIRD-SHAPED—FRONT (No. 254456)

BIRD-SHAPED—SIDE (No. 254456)

STONE IDOLS

Fewkes Collection

STONE IDOLS

Several small stone idols (pls. 47, 48)[1] were found during the excavation and repair of Casa Grande, among which are represented a human being, a lizard, and a bird. These objects are as a rule rudely made and exhibit no traces of pigment. As most of them were found in a shrine, we may suppose they were used ceremonially. The sculpturing of these objects does not indicate a high degree of art. The best image is made of diorite, evidently taken from an arroyo or a river bed. It is instructive to note that the shrine in which the images were found was situated within a compound and was not extra-mural.

Human figure.—This idol (pl. 47) evidently represents a female. The carving is very rude; the arms and legs are closely approximated to the body, the former in low relief, the latter indicated by slight ridges. The posture of the lower part of the body would seem to indicate that it was the intention to represent the figure in a sitting position. There is no mouth; a low ridge indicates the position of the nose, at right angles to one end of which are scratches showing the position of the eyes. There are no eyebrows. The surface of the idol is smooth, and it evidently was made from a river stone, which was but slightly worked.

Reptile.—It is impossible to identify the genus of reptile or batrachian intended to be represented in plate 47, which is suggestive of some tailed species, possibly a turtle or a lizard. The amount of working in the case of this specimen is somewhat greater than in that of the human figure. The rear and fore legs are drawn to the sides of the somewhat inflated body, suggesting the attitude of a frog. The head is slightly fractured. The top of the body is occupied by an elliptical depression,[2] in which are traces of red pigment.

Bird.—One of the most interesting stone idols in the Casa Grande collection, found in a shrine of Compound B with the human and reptilian images, is that representing a bird, shown in the accompanying illustration (pl. 48). The identification of this bird is not possible, but the occurrence of a bird-form image in a Casa Grande shrine is unusual. No similar stone idol[3] is known from the Gila-Salt Basin, and the few bird fetishes from the Little Colorado differ in form considerably from the Casa Grande specimen.

Mountain sheep.—The idol identified as a mountain sheep (fig. 21) on account of the large curved horns is of lava roughly fashioned. The body is quite long, the tail short; the legs appear as stumpy

[1] The numbers beneath the illustrations on the plates, beginning with plate 47, correspond to the U. S. National Museum numbers in the table on pp. 161–179.

[2] An idol found in a ruin on the San Pedro by Mr. Childs, of Mammoth, has a similar depression in the back. This idol resembles a mountain sheep, the horns being well represented. There is a similar stone idol in the museum of the University of Arizona, at Tucson.

[3] Several bird fetishes made of shell are known to the writer, but these bear no resemblance to the stone image above mentioned

appendages. In other collections from the Gila-Salt region are several idols in the form of mountain sheep, a fact which leads to the belief that this animal figured conspicuously in the myths and rituals of the inhabitants of Casa Grande.

Serpent.—One of the most remarkable stone idols from Casa Grande is a spiral specimen (pl. 48) representing two snakes twisted together. The heads of the reptiles are obscurely shown;[1] cross lines on the body indicate the markings or the scales. It has been supposed that this object is a fetish. The form, which is rare in Arizona, suggests serpent images from Mexico.

Among many carved shell objects seen in collections from the Gila Valley are several representing serpents, suggesting that the serpent assumed an important place among Casa Grande fetishes.

Unknown animal.—This object (pl. 48), while bearing little resemblance to an animal, was evidently fashioned with care for a purpose, and suggests certain animal fetishes found among the Pueblo Indians. The image is of lava, has a rough surface, and is unique in the collection.[2]

FIG. 21. Stone image of mountain sheep.

STONE IMPLEMENTS

A fairly large number of stone implements was found at Casa Grande, the section near Clan-house 1 being especially rich in such objects. The specimens (pls. 49–71) consist of axes, hammers, mauls, perforated stones, paint grinders, mortars, corn grinders, sinkers, disks, beads, ceremonial stones, polishers, crystals, and other cult objects. Considering the extent of the excavations at Casa Grande, a greater number of stone objects was expected. The implements range in hardness of material from diorite to friable sandstone. While most of the implements are smoothly polished, several are rough and unfinished, showing marks of chipping combined with polishing. Several stone implements were picked up on

[1] Among the interesting specimens from Casa Grande recorded in Mindeleff's list is a "small stone vessel with a serpent carved on the outside." The writer has referred this specimen to "Magic Tablets," a similar specimen having been recorded from the Tonto Basin.

[2] As a rule there are more of these figurines in Gila Valley ruins than in other places in Arizona where the writer has worked.

(No. 252161) (No. 252307) (No. 252309) (No. 252308)

GROOVED STONE AXES

(No. 252320) (No. 252331) (No. 252317) (No. 252310) (No. 252323)

GROOVED STONE AXES

(No. 252325) (No. 252322)

a *b*

(No. 252012) (No. 252324)

c *d*

GROOVED STONE AXES

the surface, but the majority were found promiscuously during the excavations, or came from graves, evidently having been deposited as offerings with the dead. Several were found on the floors of rooms in the compound.

The ancient inhabitants of Casa Grande were adept in the manufacture of cutting implements, which are made of very hard stone. The favorite stone for mortars and meal grinders was a volcanic rock of close texture which is very abundant in the hills not far from the ruins. As a rule the stones from which implements were made came from the river bed.[1]

Axes.—Most of the axes (pls. 49–55; also figs. 22–27) are grooved on two faces and one edge, the groove not extending over the remaining edge, a form typical of Gila Valley axes. In one or two

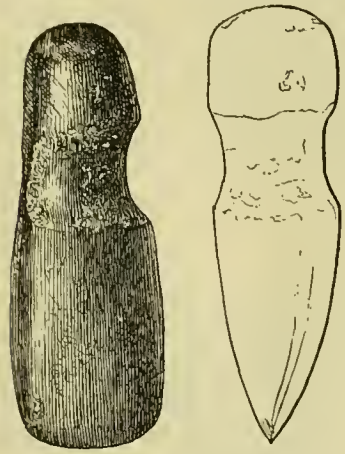


FIG. 22. Stone ax.

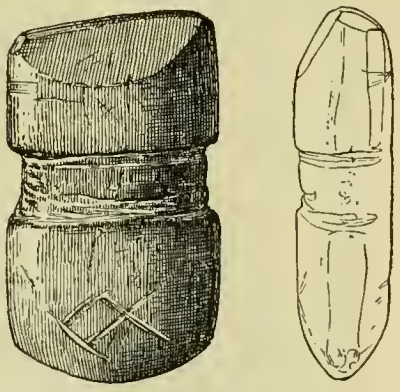


FIG. 23. Stone ax.

examples (pl. 55 and fig. 23) the groove completely surrounds the ax, and there are specimens without a groove, its place being taken by a nick in one edge. One end of these axes is sharp, the other blunt. There are also several double-edged examples; these are finely made, their edges being curved and showing little evidence of use. Each of two specimens has a groove on one side as if for the insertion of a wedge to strengthen the hafting.

The beautiful double-bladed axes shown in plate 51 are grooved on the faces and one edge. Specimen *a* is not grooved on the sides but has a notch on one edge. This ax is one of the most beautiful in the collection. Specimen *b* has a deep groove with a ridge on each

[1] The modern Pima make use of the ancient stone implements, finding it easier to procure these from ruins than to manufacture them. Their stone metates and manos, or grinding stones, are coarser than the ancient specimens, a fact sometimes cited to prove that the Pima are not descended from the Hohokam.

side and resembles specimens from northern Arizona. Another partially grooved ax is shown in figure 24. The specimen figured as *c* of plate 51 shows the effects of fire, being much splintered. This was once a fine implement, sharpened at each end, with a shallow groove on two sides and the rim. Specimen *d* is likewise a double-bladed ax but is not so finely polished as that last mentioned. The specimen shown in figure 25 was found in the grave of the chief of Clan-house 1. With one exception none of the axes show marked ridges above or below the groove, a feature common to grooved axes from Hopi ruins.

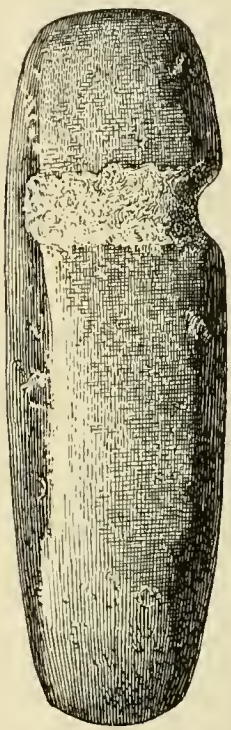


FIG. 24. Stone ax.

Plate 52 shows four typical stone axes which differ somewhat in form; the differences are more in the shape of the poll and in the cross-section, the groove for hafting being nearly uniform in all. Specimen *a* is somewhat pointed and *b* is smoother at the edge than on the sides; *c* is deeply grooved while in *d* the groove is shallow.

The two specimens figured in plate 53 are exceptional, one side being flat and the opposite side convex; the groove is confined to the latter side, extending in *b* from a point near one edge to the other edge.

One of the axes (pl. 54, *b*) was too large, perhaps, for use as such; its surface shows marks of pecking, and in some places the original smooth surface. Possibly this is an unfinished implement. Specimens *a* and *d* in this plate are almost circular in section, while *c* is nearly rectangular.

The remarkable ax figured in plate 55 viewed from the side and the front, is of unusual character, although in general form it is not very different from the typical Casa Grande ax. One face and a part of the groove show decided roughness, ascribed to secondary chipping.

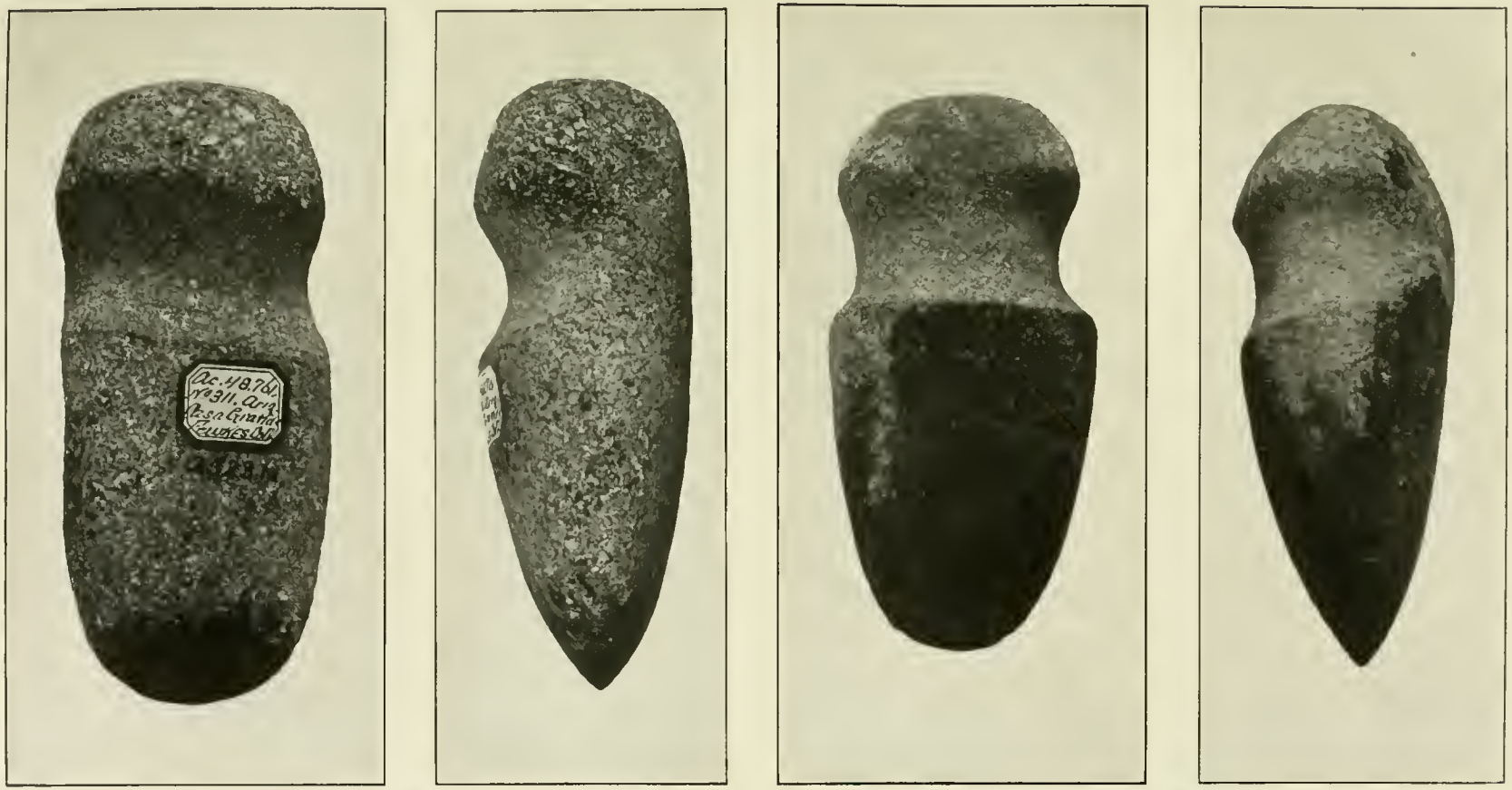
Grooved hammers or mauls.—There are in the collection many grooved stone hammers more or less battered on their ends by long and hard usage. Most of them are regular in shape. Some of the hammers were originally axes which, becoming greatly worn or broken at the edge, were adapted for use in pounding. Several hammers are illustrated in plates 56 and 57 and figures 26 and 27.

Some of the hammers are circular in cross section, elongate, grooved on three sides and convex at the ends, or are dumb-bell shaped, short and stumpy. Others are almost square in cross section. The two ends may be of equal size, with the groove

(No. 254306) (No. 254307) (No. 254308) (No. 254305)

c *d* *b* *a*

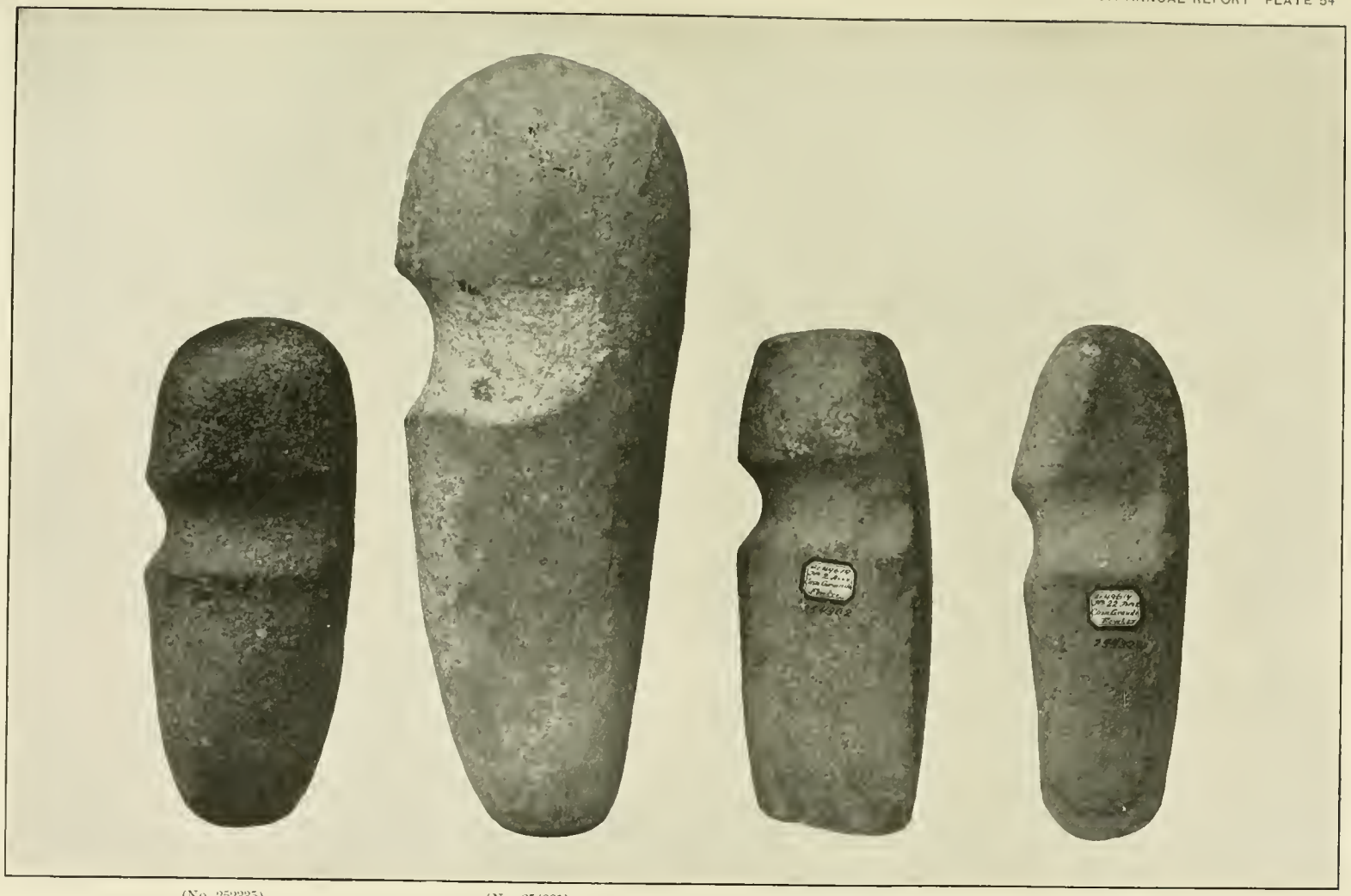
GROOVED STONE AXES



(No. 252311) (No. 252312)

a *a′* *b* *b′*

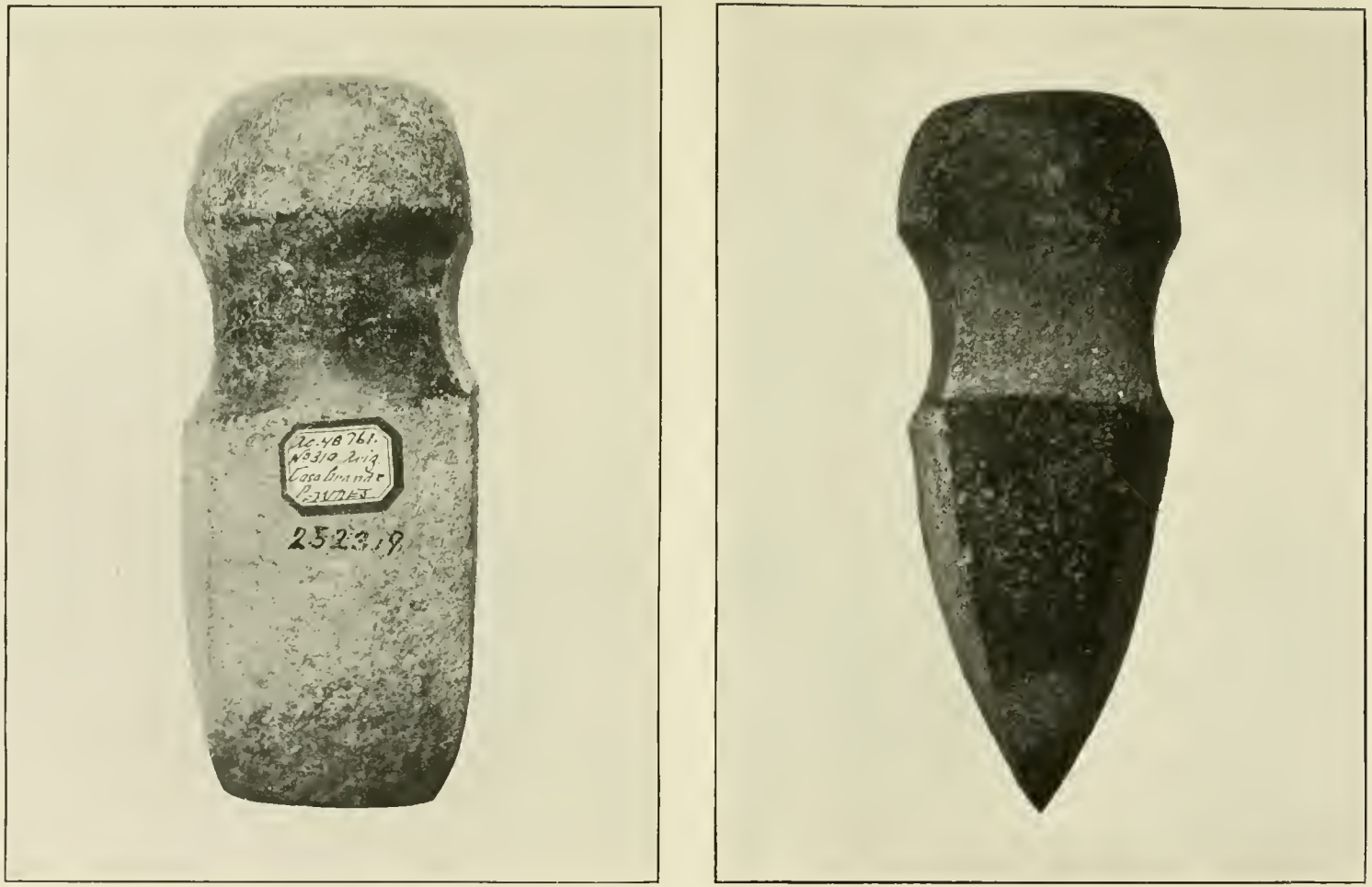
GROOVED STONE AXES



(No. 252335) (No. 254301) (No. 254302) (No. 254322)

a *b* *c* *d*

GROOVED STONE AXES

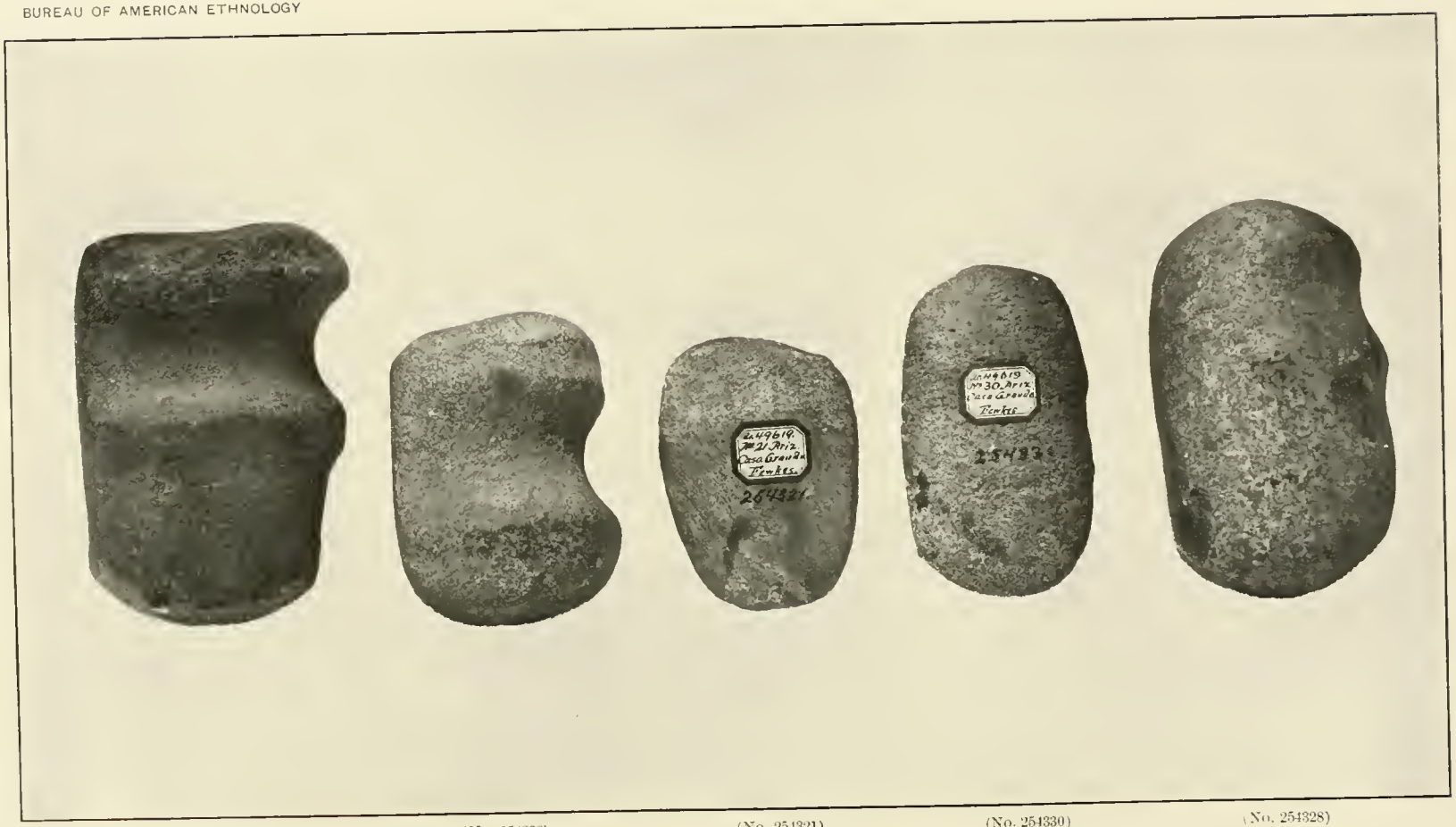


(No. 252319)

GROOVED STONE AX, SHOWING EFFECTS OF SECONDARY PECKING

(No. 252330) (No. 252326)

STONE HAMMERS



(No. 254326)
a

(No. 254329)
b

(No. 254321)
c

(No. 254330)
d

(No. 254328)
e

STONE HAMMERS

(No. 254459) (No. 252164) (No. 252170) (No. 252163)

a *b* *c* *d*

PROBLEMATICAL STONE IMPLEMENTS

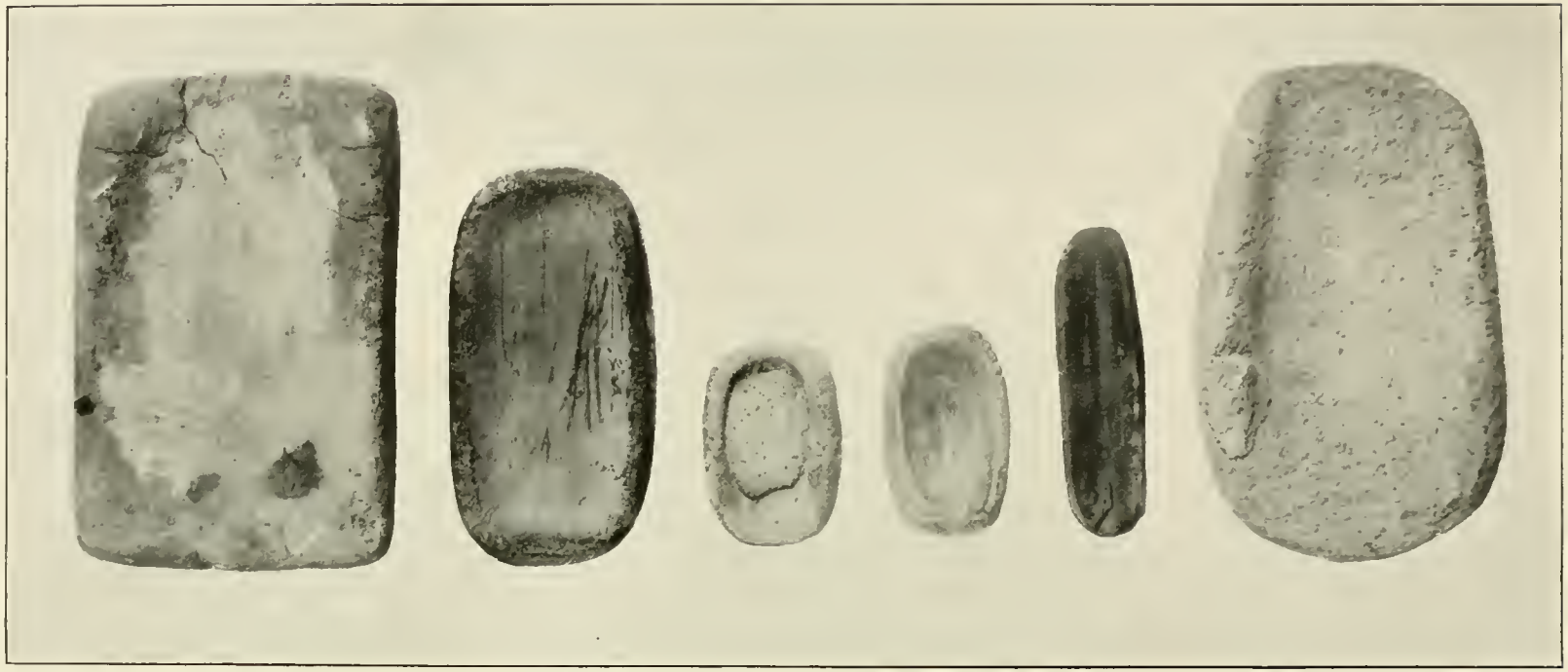
(No. 254337) (No. 254336) (No. 254454)

a *b* *c* *d* *e*

(No. 252054) (No. 252043) (No. 252336) (No. 252054)

f *g* *h* *i*

PROBLEMATICAL STONE IMPLEMENTS



(No. 254390) (No. 254395) (No. 254398) (No. 251679) (No. 254450) (No. 254394)

a *b* *c* *d* *e* *f*

GRINDING-STONES

midway in the length, or of unequal dimensions, with the groove nearer one end. A typical hammer of dumb-bell shape is shown in figure 27. The hammers shown in plate 57, *a*, *b*, are very much worn at what was formerly the sharp edge, and the polls are very flat; *c* is much worn down on both ends; *d* is without groove; and in *e* the groove is inconspicuous.

Problematical implements.—Under this head may be mentioned the long, thin, flat stones (as pl. 58, *d*), some of which are sharp at one extremity and blunt at the other. One of these specimens (*b*) is broad at one end and tapers uniformly, while another (*c*) is shovel-shaped.

In this category may be mentioned a broken implement having two deep marginal incisions, which, perhaps, should more strictly be assigned to objects of the hoe or shovel type. This unique specimen (pl. 58, *a*), which is of slate, has incised markings on the flat face.

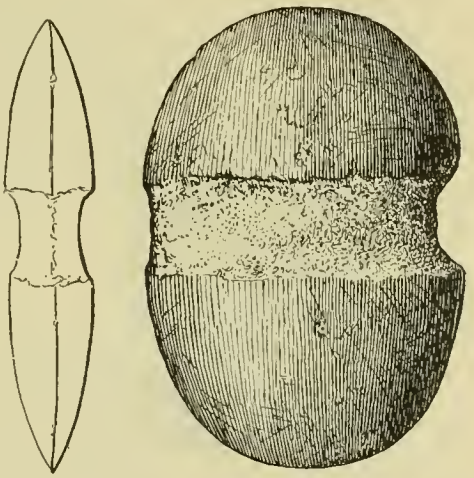


FIG. 25. Grooved double-edge ax.

Of the specimens figured in plate 59 it is probable that *a* and *d* represent pestles; *b*, *f*, and *i*, grinding stones; and *g* and *h*, pecking stones. The purposes for which *c* and *e* were used are not clear.

One of the objects (*e*) shown in plate 66 probably served as a paint-grinder, while *d* and *e* of the same plate may have been used as pecking stones.

Plummet-like object.—A remarkable stone object (fig. 28) from Casa Grande, found deeply buried in the earth covering Compound B, is a cylinder provided with an eyelet in the top, like a plumb-bob, the whole resembling in form an object of unknown use from Mexico. On account of its form it has been suggested that this object was employed as a plummet by the ancient masons. Although the validity of this theory is regarded as very doubtful, no suggestion is here made of the meaning of this most exceptional specimen.

Tablets.—Certain flat rectangular stones, called tablets, most of which are of slate, have smooth margins; the ornamentation of their borders varies considerably, in some specimens taking the form of parallel lines arranged in clusters. One of these tablets (pl. 60, *d*) is typical of many found in ruins in the Gila-Salt Valley, and suggests a pigment slab.[1]

[1] This specimen resembles certain slabs of animal shape, one of which was figured years ago in the writer's report on the antiquities of the upper Gila (see *23d Ann. Rep. Bur. Amer. Ethnol.*, pp. 185–186).

Arrow-shaft polishers.—Several grooved stones, identified as arrow-shaft polishers, two of which (pl. 61) are fine specimens, were dug up at Casa Grande. The best specimen has a double groove and a surface ornamented with incised lines. Another, of equally fine workmanship, is smaller and considerably broken. Both are made of a black stone, the surface of which is highly polished, especially along the grooves. One of the specimens is oval in shape; the other rectangular.

Grinding stones.—Slabs and disks used for grinding purposes are fairly common at Casa Grande. The several specimens found vary in size, shape, and other characters. They are circular or rectangular, with or without a marginal groove; many are provided with a knob. These objects (pl. 62) are ordinarily made of lava or other hard rock. It is not clearly known whether they served for grinding pigments, seeds, or other substances. Corn grinding was accomplished by means of larger implements, as metates and manos, many forms of which are found in the collections.

FIG. 26. Stone hammer.

The metates (pl. 60, *f*) are in no respect exceptional.[1] As a rule these are made of lava; they are flat or concave on one side, many are rough on the opposite surface, and some have marginal ridges. The manos, or hand stones (pl. 63), vary in size and shape as well as in the material of which they are made. A common form is flat on one side, rounded on the opposite, with edges and ends rounded. The grinding surfaces of others have two planes at an angle forming a ridge along the middle. None of the metates were found set in boxes as among cliff-dwellings and pueblos, and it is probable that when used they were simply placed on the floor, the women kneeling while employed in grinding.

Stones used as paint grinders (pls. 64, 65; 67, *e*; and figs. 29, 30), many showing traces of pigment on their surfaces, vary in size and shape

[1] None of the metates found have legs, although Doctor Russell speaks of metates provided with three legs, and the writer has found examples of this type elsewhere, but not at Casa Grande. They were apparently laid on the floor and moved from place to place as needed.

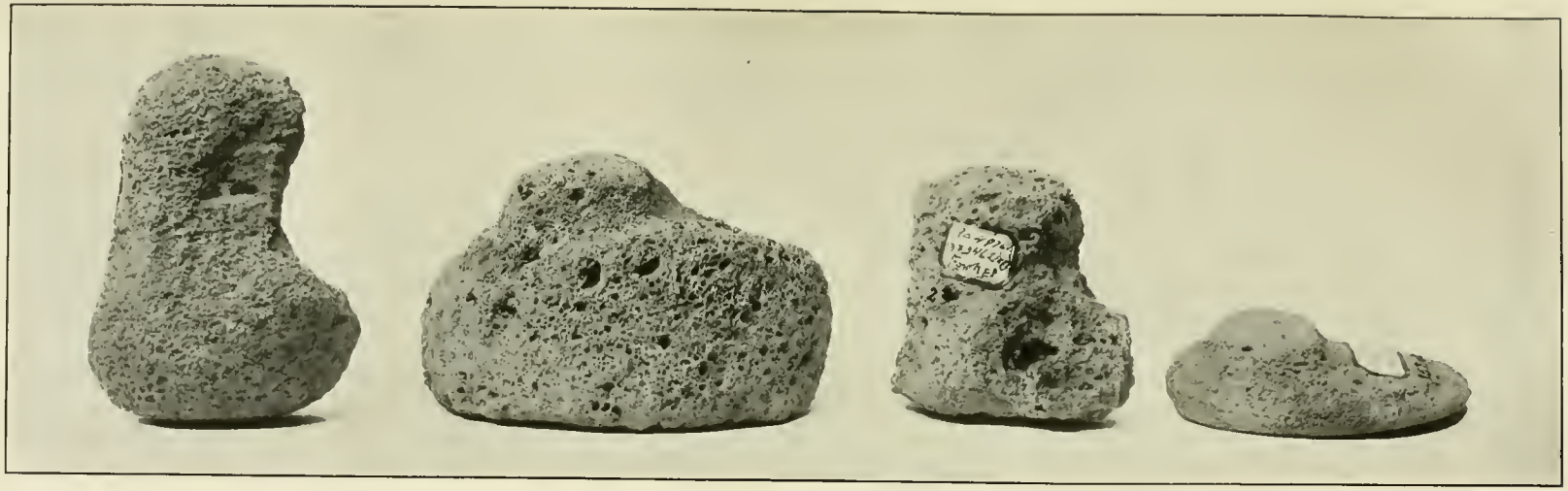
(No. 252342)

CHIPPED STONE

ARROW POLISHERS

UNFINISHED PIPE

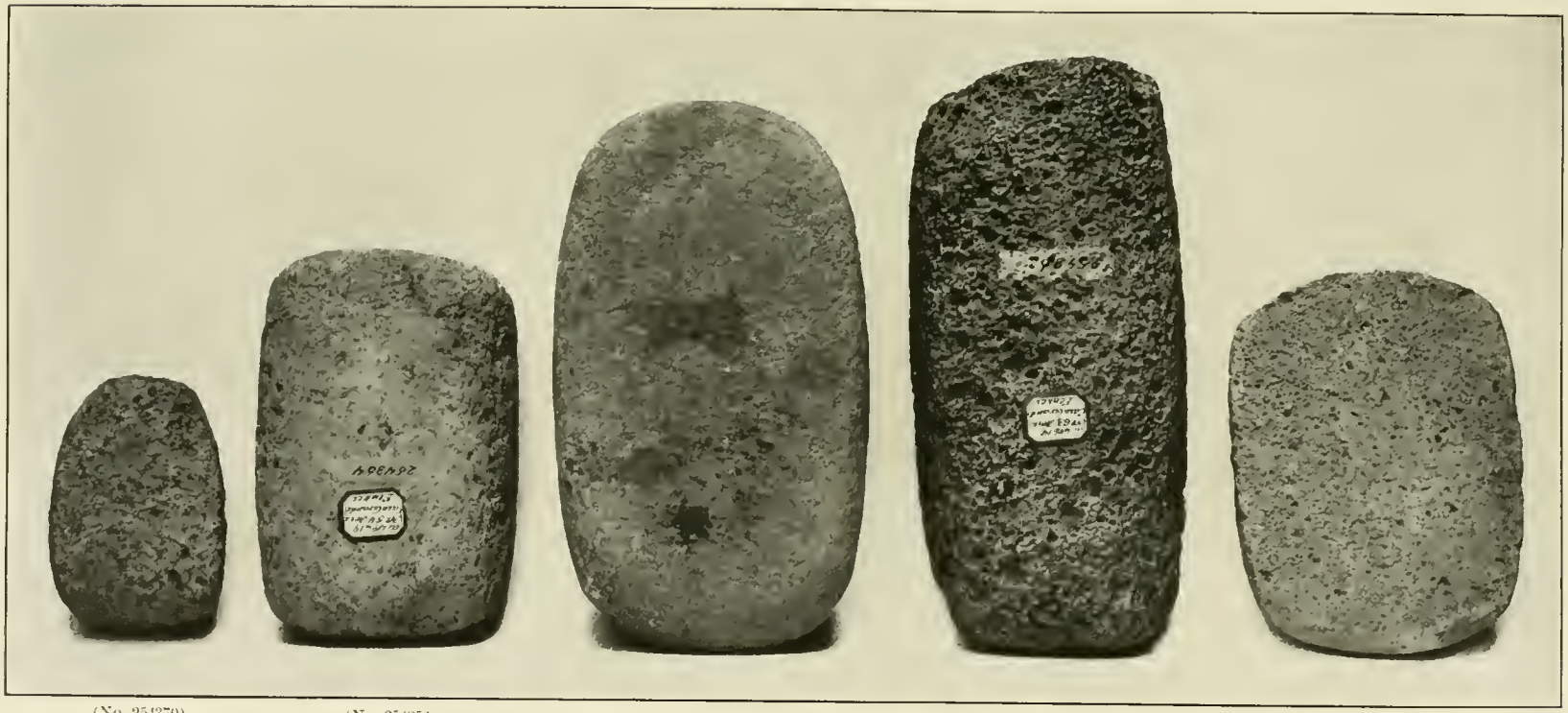
STONE IMPLEMENTS



a *b* (No. 252246) *c* (No. 252166) *d*

e *f* *g*

GRINDING-STONES



(No. 254370) (No. 254354) (No. 252052) (No. 254363) (No. 252165)

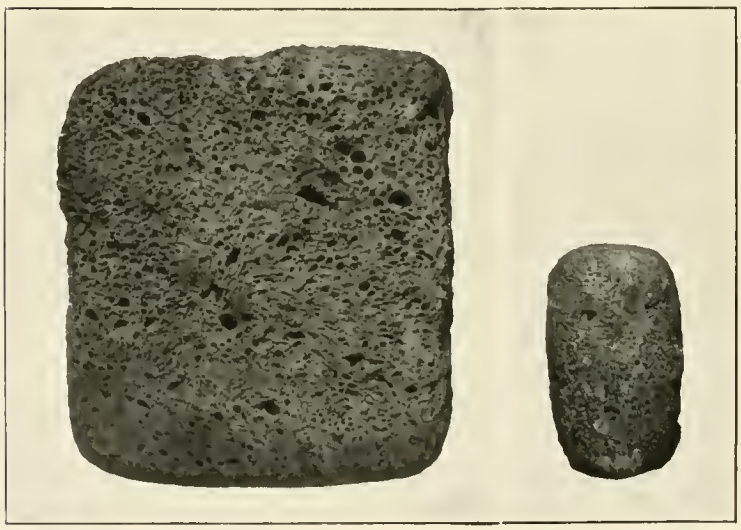
MANOS

(No. 254371)

a *b*

(No. 254392) (No. 254391)

c *d*



(No. 254110)

e *f*

MORTARS AND PESTLE

from a small slab containing a slight superficial depression to a well-formed mortar. Pigments ground in these utensils were used for decoration of face and body and for ornamentation of pottery.

To the surface of one of the best of these grinders still adhere stains of green paint that had been ground on it. This (pl. 60, *a*), the most interesting perhaps of all the paint grinders, is made of hard blackish stone; it is rectangular, about 10 inches long. There is a slight symmetrical depression on one side; the rim is decorated. With this specimen was found a finely made pestle (fig. 30), also of hard stone, with smooth finish, its grinding end slightly flaring. Both these objects were exhumed from the burial cyst of Clan-house 1, accompanying the skeleton of the priest, or possibly chief. The finger bones of the right hand, when found, still held fragments of paint, and there were arrow-points and spear-points in the left hand.

FIG. 27. Dumb-bell shaped stone maul.

Plate 62, *a*, shows one of these rubbers of oval shape with a knob-like projection at one side. In *b* the rubbing part is more massive, while the handle, which is not very prominent, occupies a similar position. In *c* the handle is more elevated and the rubbing portion of the stone relatively smaller, while in *d* the handle is greatly depressed and the rubbing part elongate. Specimen *e* represents a fine rubbing stone belonging to the series having the knobs between the center and the periphery, while in *f* the handle is centrally placed and the body is circular and thin; the latter is one of the best made of all the rubbing stones in the collection. In *g* the diameter of the knob is only slightly less than that of the body of the grinder.

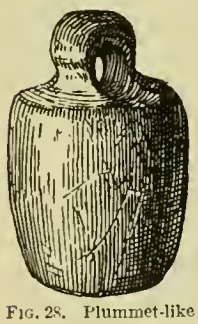


FIG. 28. Plummet-like object.

Mortars.—These range in form from circular to rectangular; some are deeply concave, some have nearly a plane surface. One of the simplest specimens (pl. 64, *c*) is of irregular shape, concave on one side; *d* is almost rectangular, considerably longer

than broad; *a* and *b* show no sign of concavity; and *e* is barely more than a flat stone.

From the simple mortars last mentioned we pass to those more elaborately made, shown in plate 60. Specimen *b* is rectangular, with a thin border surrounding a shallow smooth concavity. The rim of the depression is raised at each end, differing in this respect from *f*, which is practically a metate. Specimen *e* is much longer than broad, the depression resembling a groove rather than a concavity, while figure *d* in addition to a raised rim has bars across the rim, approximating in form a tablet (p. 125). Specimen *c* resembles a miniature metate but may be a concretion of symmetrical shape.

FIG. 29. Tool for rubbing or grinding pigment.

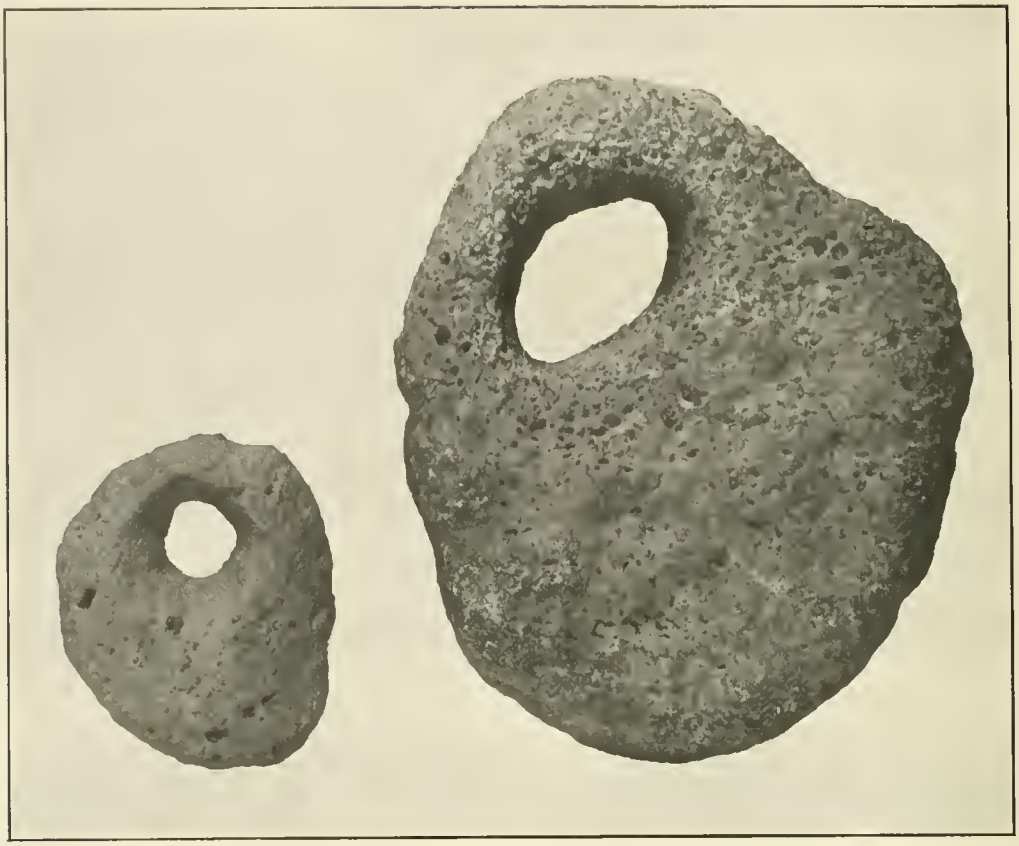
The two mortars shown in plate 65 are typical, the one (*a*) oval, the other (*b*) circular in shape. They were doubtless used as at present among the Pima in bruising mesquite beans and in crushing seeds. The cavity was either worn out by constant use or it may have been worked out with pecking stones. The lava of which these mortars were made, both a soft porous kind and a hard compact variety, is found in the mountains near Casa Grande.

Although there are in the collection no wooden pestles to use with these mortars, the native ironwood was well adapted for the purpose and no doubt was so employed.

(No. 254399) (No. 252233)

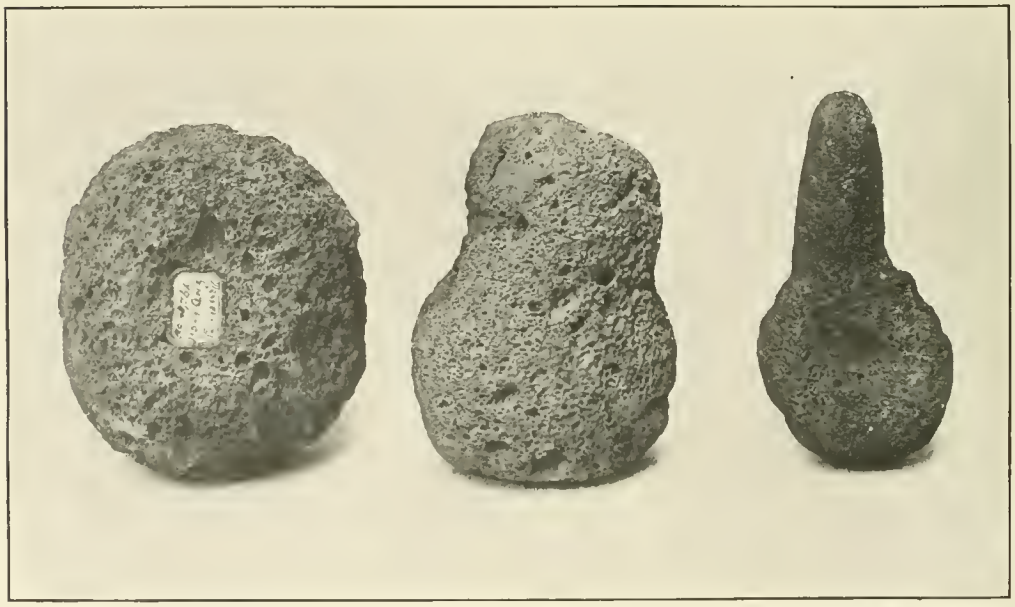
a *b*

MORTARS



(No. 254197) (No. 254196)

a *b*



(No. 252044) (No. 251680)

c *d* *e*

PROBLEMATICAL STONE OBJECTS

Perforated stones.—Among the problematic stones from Casa Grande are several specimens (pl. 66, *a*, *b*), measuring from a few inches to 2 feet in length, with a large perforation near the margin. None of these stones are polished, and their rough exterior shows no signs of decoration. The use to which these objects were put is unknown, but their presence in all collections from the Gila and Salt River ruins indicates that they were important.[1]

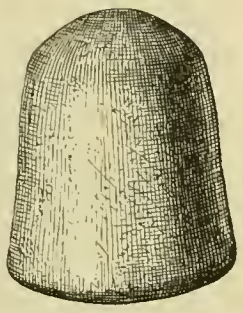


FIG. 30. Paint pestle from burial in annex room M, Clan-house 1.

An irregular stone slab having an ovoid perforation (fig. 31) may be merely a discarded paint or seed grinder, the hole through it being the result of wear. The suggestion that it was used in a ball game as the perforated stone through which a stone ball was thrown is hardly tenable.

Perforated disks of stone (fig. 32) are among the rare objects found at Casa Grande. These have the same general shape as the perforated

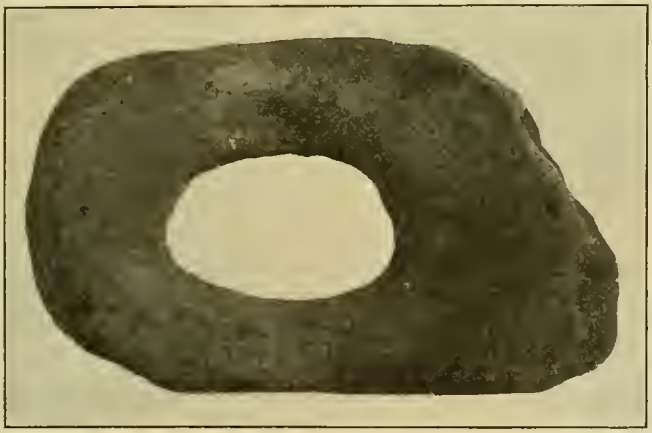


FIG. 31. Perforated stone slab of unknown use.

pottery disks which are common throughout the Pueblo area. It is supposed that these objects were employed in games, but some specimens were undoubtedly used as spindle whorls. The larger stone disks, of which there are several in the collection, varying in size and degree of finish, were probably used as covers for mortuary jars.

[1] It has been suggested that these objects were hung from rafters of houses or from trees or bushes and served as sounding stones, or gongs, to call the people together, but the fact that many of them are of soft nonresonant lava would seem to preclude their employment for such purpose.

A ring-shaped stone was probably used in a game. It is not unlike one described and figured by Doctor Russell.[1] Of the use of such stones he is doubtful, but says:

> A few rings of porous lava have been found about the ruins which have been called "head rings" because of their resemblance to the ordinary head rings of cloth or bark in common use among the Pimas. . . . However, as most of them are too small and the material is extremely unsuited for such a purpose, it is much more probable that they were employed in some game with which the present race is unacquainted.

Medicine stones.—The Arizona Indians, especially the Hopi, make use of a variety of stones in their medicine ceremonies; these differ in shape, color, and degree of hardness, properties considered important by the priests. To this category belong rock crystals, botryoidal stones employed in treating disease or by sun priests in rain ceremonies. Any strangely formed stone, as agatized wood, a fossil or concretion, a fragment of lava, was regarded, no doubt, by the priests of Casa Grande as efficacious in sacred rites.

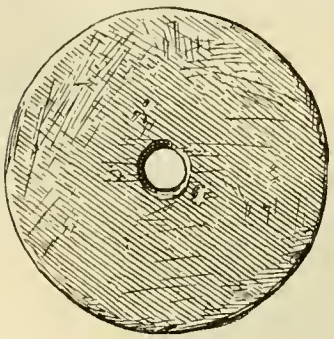


FIG. 32. Perforated stone disk used in game.

Crystals of quartz (pl. 67, *a*) are prized by many of the Southwestern tribes for medicinal purposes. These crystals are found in several ruins in northern Arizona, where they had, no doubt, the same significance. Numerous quartz crystals were found at Casa Grande. It is known from legends of the Pima as well as from Pueblo traditions that such crystals were employed in the practice of medicine; specimens have been found in fetish bags of the dead.

Pigments.—From their constant use in ceremonial proceedings, stones and minerals suitable for pigments are highly prized by all Indians. The same pigments were employed by the natives of Casa Grande as by the northern Pueblos. The most common of these appear to have been various oxides of iron, carbonates of copper, black shale, and gypsum. These were prepared by grinding, in much the same way as the Pueblos prepare their paint materials. A medicine outfit containing several different pigments was found with what is herein described as a priest's skeleton, in a room in the northwest corner of Compound A.

Arrow-heads and spear-points.—The author has seen a considerable collection of fine arrow-heads picked up at Casa Grande. These objects differ in no respect from other arrow-heads found throughout the Southwest. Most of them were gathered from the surface of the ground and may have been dropped by those who built the Casa Grande compounds or by other people.

[1] *Twenty-sixth Ann. Rep. Bur. Amer. Ethnol.*, p. 181.

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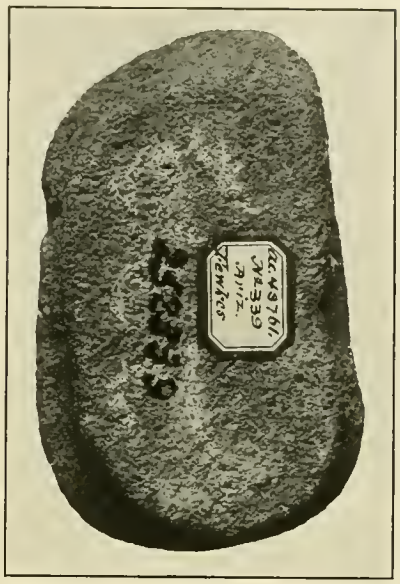
a



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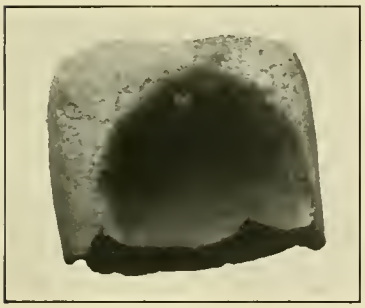

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MISCELLANEOUS OBJECTS

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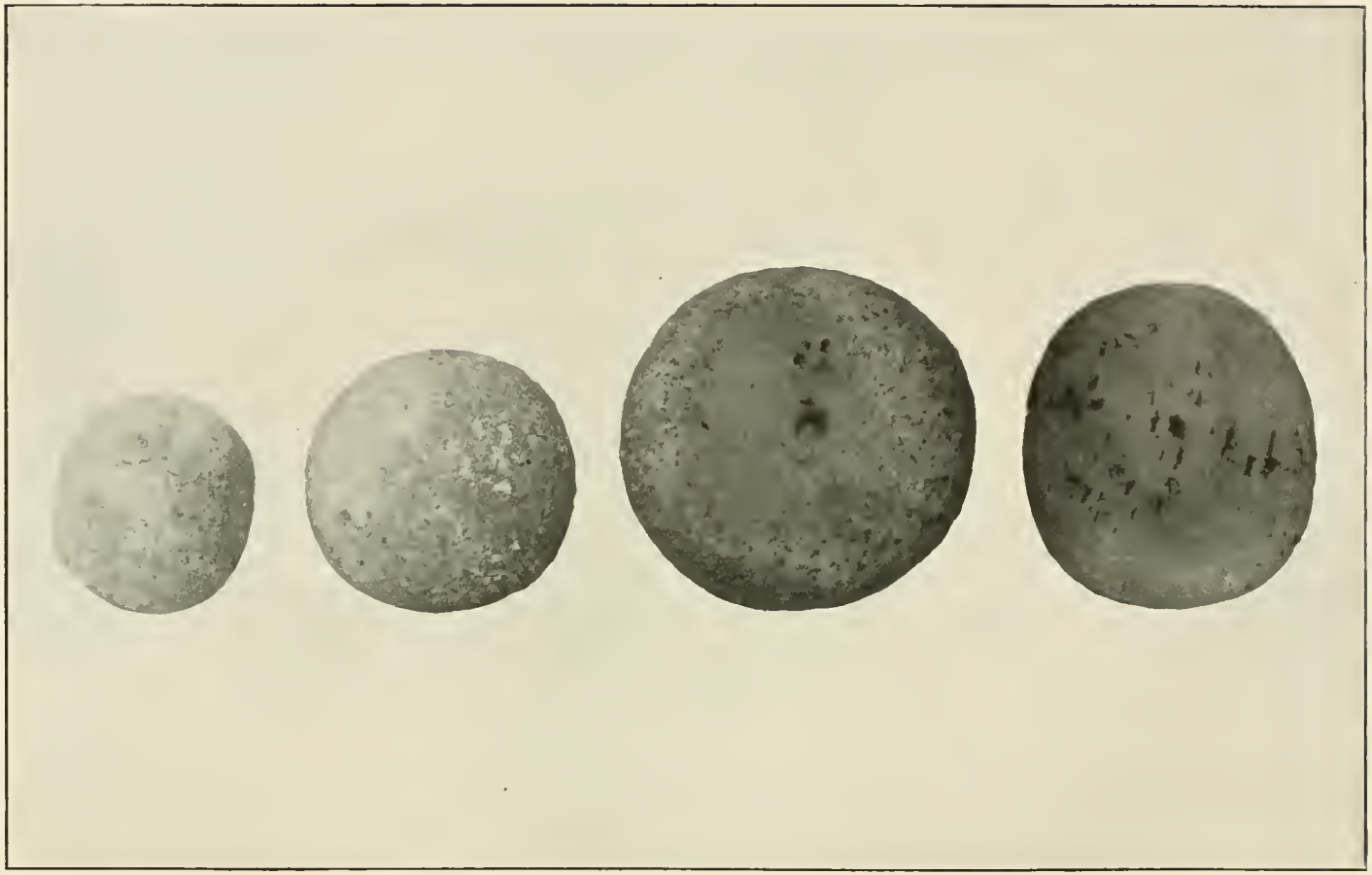
STONE DISKS



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a *b* *c* *d*

STONE BALLS AND DISK

(No. 254430) (No. 251672) (No. 254429) (No. 252182) (No. 254428)

STONE SHOVELS

(No. 254432) (No. 254427) (No. 254424) (No. 254425) (No. 254431)

STONE SHOVELS

Miscellaneous stones.—Several fragments of obsidian and a few flint flakes, water-worn pebbles, squared pieces of lava of unknown use, baking stones, an object shaped like a whetstone, and various nondescript objects (pl. 67, *b*, *d*) are contained in the collection. A single specimen of knife or projectile point (fig. 33) was found in the ruins. Many specimens of fossil wood were taken from one of the shrines, and concretions were uncovered from various places in the compounds. Among other problematic specimens are elongate or cubical objects of coarse sandstone, a hemispherical object of pumice, and a small pointed stone used perhaps as a drill.

Fragments of artificially worked mica, asbestos, galena, and chalcedony are also in the collection from Casa Grande. Like the ancient people who inhabited the northern pueblos, those of the south prized petrified wood, obsidian, any stone of grotesque shape, fossils, and water-worn pebbles. Many of these specimens must have been brought a considerable distance, as they are different from stones found in the immediate vicinity.

Disks and balls.—Stone disks (pls. 68; 69, *d*) and balls (pl. 69, *a*, *c*, and fig. 34) of various sizes were found in considerable numbers. These were artificially worked and are supposed to have belonged to gaming paraphernalia, but they may have been used as weapons. In the latter case, it may be supposed they were fastened to handles with thongs of skin. These balls should not be confounded with the small smooth pebbles used for polishing pottery or with ceremonial stones used in making medicine. There are several stones similar to those used in the Hopi foot race, "kicking the stone," in the collection.

FIG. 33. Knife or projectile point.

Beads and pendants.—Several stone beads and pendants (figs. 35–38) of various sizes and shapes are contained in the collection. Some are spherical, many are perforated cylinders, while others consist of fragments of turquoise perforated for use as ear or neck ornaments.

A piece of carved red jasper (fig. 37), evidently an ornament, may be appropriately mentioned in this place. Fragments of mica were probably used for a similar purpose. Little squares of turquoise show evidences of having once been portions of mosaic, like the mosaic frog from Chaves Pass, figured elsewhere.[1] Fig. 38 is a tooth-shaped stone ornament.

Shovels and hoes.—There is a number of flat implements of slate (pls. 70, 71), sharp on one edge and blunt on the opposite, identified

[1] *Twenty-second Ann. Rep. Bur. Amer. Ethnol.*, pl. XLIV.

as shovels and hoes. Some were probably attached to handles (fig. 39), or even held directly in the hand. One or more of these are shaped like spades, an extension on one side serving for attachment of a handle; others are elongate, circular, or semicircular.

Slate appears to have been the material most commonly employed in the manufacture of these implements, obsidian being better adapted for cutting tools.

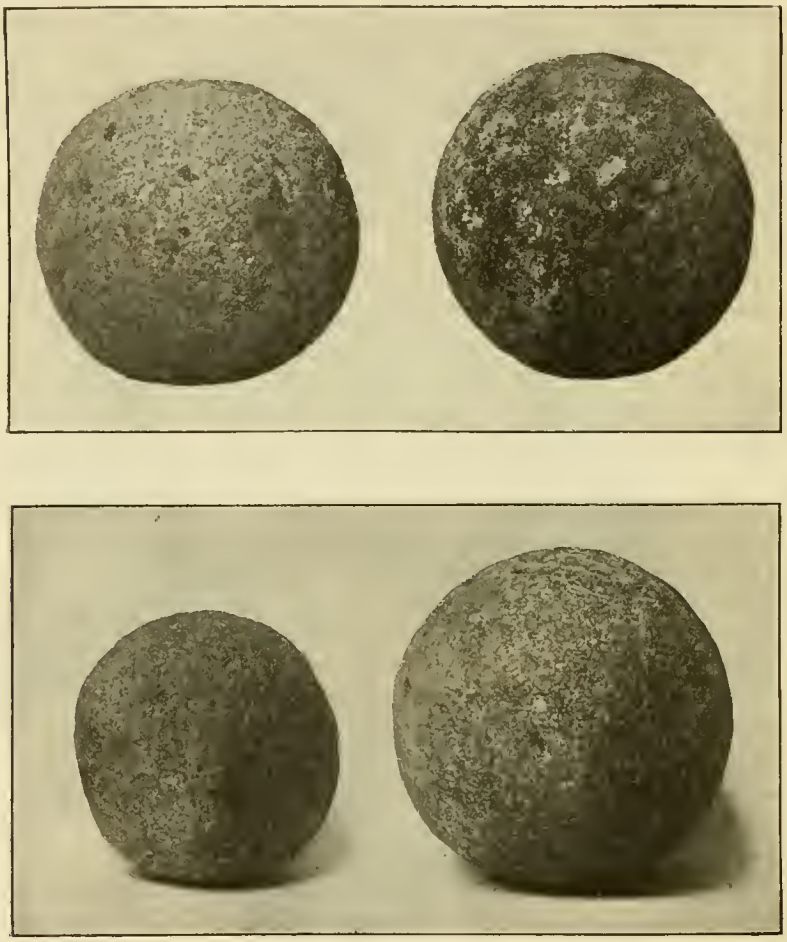

FIG. 34. Stone balls.

Several hoe-like implements, especially those without indication of attachment, are chipped along the sharp edge, the opposite edge being thicker and smooth. These (pl. 71) are more like scrapers than shovels, and may have been used in dressing skins.

MORTUARY URN (No. 254605)

(No. 254613) (No. 254615)

SCOOPS

(No. 251677) (No. 254626) (No. 254628)

TRIPOD DISH BIRD-SHAPED VASE SPOOL-SHAPED OBJECT

POTTERY

CUP BEARING GEOMETRIC ORNAMENTATION (No. 254603)

FOOD-BASIN FOOD-BOWL (No. 254618)

MEDICINE-BOWL (No. 251681)

POTTERY

POTTERY

Pottery objects of almost every form known among Pueblos, including food basins or bowls (pl. 73), vases, ollas, ladles, spoons, and cups, are found in Gila Valley ruins. The Casa Grande pottery resembles that found in the other ruins of this region. Unfortunately it consists for the greater part of fragments, only a few pieces being

FIG. 35. Stone bead.

FIG. 36. Stone ornament.

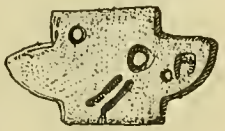

FIG. 37. Ornament of jasper.

entire when found. Some of the more fragile bowls show signs of repair, an indication that cracked vessels were not immediately discarded.

SPECIALIZED FORMS

Spool-shaped object.—This specimen (pl. 72) is different from any other in the collection; the use to which it was put is not known.

Medicine-bowl.—This bowl, illustrated in plate 73, is cylindrical except for the slightly flaring rim. In the middle of the upper surface is a circular depression, between the raised rim of which and the outer margin of the lip the surface is concave. Any decoration this surface may once have borne has become obliterated. The ornamentation of the sides, now more or less obscure, consists of a series of vertical parallel lines alternating with crooks, or terraces, as shown in the illustration. The rim of this bowl is broken in places, a result no doubt of hard usage since it was discarded. One form of these bowls resembles a pottery rest, the depression consisting merely of a shallow concavity in the surface. Several examples of these vessels, made of undecorated ware, were found (see spool-shaped object, pl. 72).

FIG. 38. Tooth-shaped pendant of stone.

Spoon-shaped scoops.—Several pieces of pottery have the form of scoops (pl. 72); the handles are formed by prolongation of the rim.

Dishes.—There are several small shallow dishes (pl. 72 and fig. 40), undecorated, each mounted on three stumpy legs.

Water jar.—In a corner of a room in Compound A, directly under the old stage road from Casa Grande to Florence, was found a very large jar, or olla. Hundreds of people have driven over the spot beneath which this jar was buried. The object was left in place, being too large to move without breaking.

Mortuary urn —The specimen here illustrated (pl. 72) is of typical form. A stone disk luted in place with adobe served as a cover.

In addition to those above mentioned there are various earthenware objects in the collection. Among these is a vessel with slanting sides, a flat bottom, and a hooked handle. Another specimen (pl. 73) is a cup provided with a handle looped on one side. This cup bears geometric ornamentation in the form of triangular designs in red.

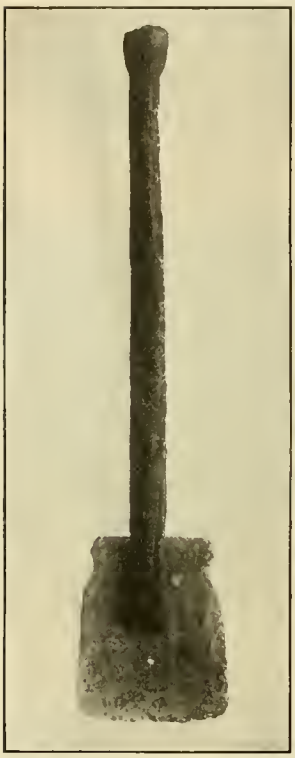

FIG. 39. Shovel with handle.

Most of the vessels when found were empty. One contained a number of shells, however, while in a few were fragments of paints of various colors.

The presence in the collection of several fragments of pottery affords evidence that relief figures and effigy vases were not rare at Casa Grande. One of the best of these is a fragment (fig. 41) from a bowl on which a face is painted; it resembles a bird's head, with the beak in relief. The specimen as restored by a Pima potter is shown in figure 42.

Bird vase.—A vase (pl. 72) having the form of a bird, with rudimentary wings and broken tail represented in relief, suggests similar pottery from the Little Colorado ruins and vases from Sikyatki, elsewhere figured. Its small size would seem to indicate that it served as a receptacle for salt, sacred meal, or other substance. This is the only receptacle of this form that was found in the course of the excavations at Casa Grande, but similar vessels are reported from several other ruins in the Gila region. In this vase only the rudiments of the wings appear as low ridges on the opposite sides, the avian form being greatly conventionalized. There is no sign of paint on the surface, but it is probable that the wings at least were once decorated with parallel lines, as is customary in bird effigy vases from the Little Colorado.[1]

Images of animals.—One or two small clay effigies of animals (pl. 67, *c*) were found at Casa Grande. These are rudely made, their forms not being sufficiently well modeled to admit of identification.

[1] See *22d Ann. Rep. Bur. Amer. Ethnol.*, p. 68.

It seems to have been a universal custom among the people of the Gila compounds, as among those elsewhere in the Southwest, to make animal images for sacred or secular use. These objects may have served at times as playthings but often may have had a ceremonial use, for it is probable that they were manufactured to deposit in shrines, thus serving as prayers for the increase of the animals they represent, just as a few years ago (possibly to-day also) the Hopi deposited in the corner of their sheep corrals clay imitations of sheep and in certain shrines wooden eagle eggs.[1] These effigies may be classed as prayer objects, to the use of which in Hopi ceremonies attention has been drawn elsewhere.

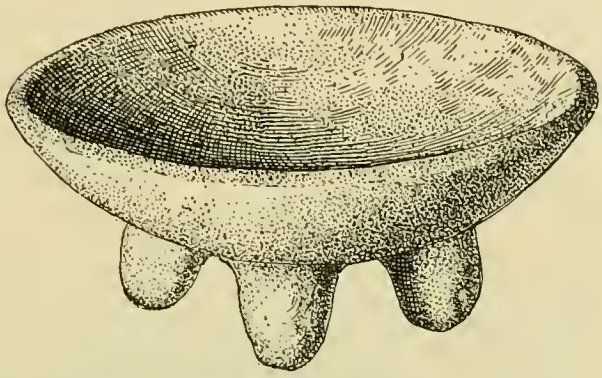

FIG. 40. Three-legged earthenware dish.

FIG. 41. Pottery fragment bearing bird's head.

The prayer objects are not regarded as symbolic representations of sacrificial offerings (as similar figurines are interpreted by some authors), but as material representations of animals desired. The sheep effigy of the modern Hopi is not a sacrifice to the god of growth, but a prayer symbol employed to secure increase of flocks. The painted eagle egg has a corresponding significance.

Pipe or cloud-blower.—The Casa Grande people used in smoking perforated tubes of clay or stone resembling pipes. The cane cigarette also was commonly used, as shown by rejected canes found in great abundance in some of the rooms of Compound A. A large number of these canes are found also in shrines or other sacred places of the Hohokam, where they were placed by the ancients.[2]

A broken pipe made of clay was excavated at Casa Grande and another was found on the ground. The former object has a slight enlargement of the perforation at one end. Although much of the stem is missing, there is no doubt that this pipe belongs to the type

[1] Many clay figurines of quadrupeds have been taken from ruins on the Salt River.

[2] The ends of these canes are invariably burnt, as if after use. The canes were deposited in shrines, following the custom which still holds in the New Fire and other ceremonies at Walpi. The ashes made by sacred fire and those from the sacred pipe are not thrown to the winds, but are placed in appropriate shrines.

called the straight-tube variety, which is considered by the best authorities to be the prehistoric form in the Southwest.

It has been suggested that the fragment of stone shown in plate 61, containing a cavity worked in the side, is an unfinished pipe, but it is so slightly shaped that its final function can not be definitely determined.

Spindle whorls.—The spindle whorls from Casa Grande resemble those of Mexico. This form of spinning whorl has never been recorded north of the Mogollon Mountains or on the Colorado Plateau, but is found southward from the Gila into Central America.

FIG. 42. Bowl bearing bird's head decoration (restored).

Many of the specimens are very much worn on the edges and one is exceptional in being grooved on the rim (fig. 43).

Perforated disks.—In addition to the spindle whorls above described were found many perforated pottery disks, some of which bear ornamental designs. The character of the decoration on some of these shows that they are simply fragments of pottery cut into disk form, while in others the disks were evidently ornamented after they were made. Small pointed rods associated with these whorls are also represented in the collection. Among the finest of the perforated disks are those made of slate. Several clay disks have no central perforation, a fact which leads the writer to ascribe to them uses other than those connected with the perforated variety.

Slabs.—The writer is unable to explain the purpose of several fragments of clay slabs (pl. 74 and fig. 44), some bordered by a

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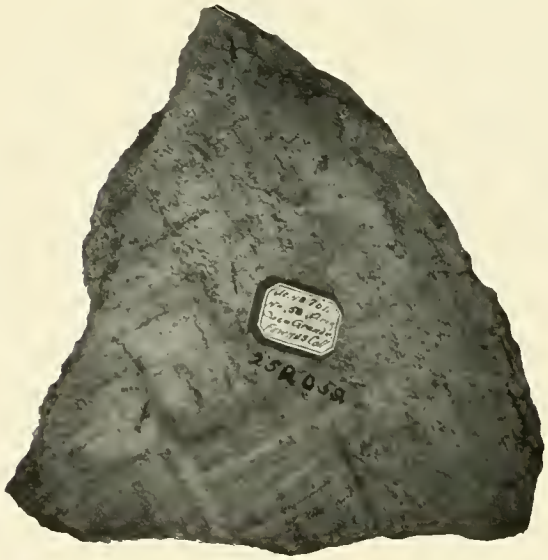
FRAGMENT OF FLOOR, SHOWING IMPRESSION OF REEDS



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FRAGMENT OF SLAB, SHOWING IMPRESSION OF BASKETWARE

CLAY OBJECTS

low ridge and bearing basketware markings on the surface, made of course while the clay was soft. Others do not have the peripheral ridge and the rectangular surface markings. In no instance is there any trace of smoke or evidence that the slabs were used in cooking. The basketware impressions are not unlike those observed on the floors of several rooms, especially the room designated O, east of Pyramid A in Compound B.

Decoration of Casa Grande Pottery

As a rule the decoration of Casa Grande pottery partakes of the simplicity characteristic of ceramic ware found elsewhere in this region. We miss in it the pictorial element, or representation of life forms, that is so marked a feature of the pottery of the Little Colorado

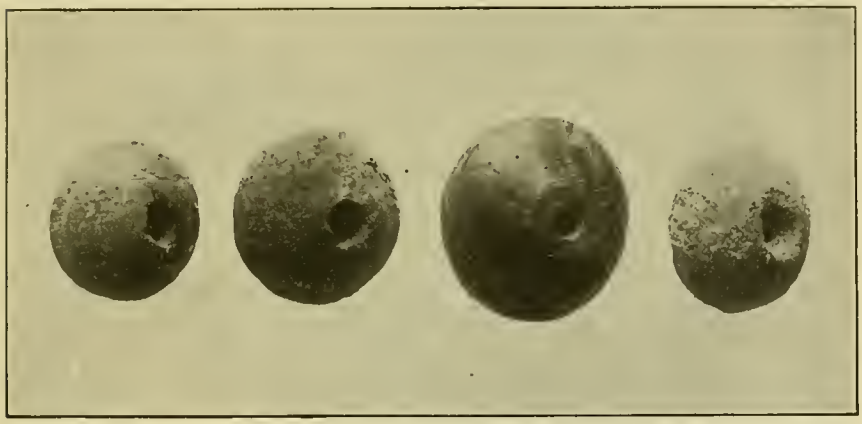


Fig. 43. Spindle whorls.

and of true Hopi or Tusayan (Sikyatki) ware, rectilinear patterns predominating. It is almost impossible to distinguish some of the geometric designs on Casa Grande ware from decorations on pottery found in the cliff-dwellings of northern Arizona and southern Colorado. This is especially true of the gray-and-black ware, which is one of the most ancient and widely distributed varieties in the Southwest. The designs on the pottery from the Gila-Salt drainage have only a remote likeness to decorations on that from the Casas Grandes in Chihuahua, although the pottery from ruins on the upper Santa Cruz, one of the tributaries of the Gila, resembles well-known Mexican forms. As a whole, however, the ornamentation of the pottery from Casa Grande may be classed as Mexican rather than Southwestern notwithstanding many pieces show northern characteristics.

While a characteristic polychrome ware is the most abundant at Casa Grande, there are found likewise vases of black-and-white[1]

[1] The potters of Casa Grande had made the important discovery, universal among cliff-dwellers and common in many pueblos, that a smooth surface can be secured by covering a rough pot with a white slip, producing what, after decoration, is commonly called black-and-white ware.

and of red-and-brown ware; also several food-bowls decorated in white-and-black, or bearing red-and-brown patterns. Most of the pieces are of red ware, undecorated. Several scoops are red, lined with black, resembling pottery from the Little Colorado ruins. There is likewise a gray ware decorated with black or brown pigment apparently somewhat changed by long burial. Coiled ware is not as common at Casa Grande as in the cliff-dwellings, but rough, unpolished ware is often found.

Many of the geometric figures used in the decoration of Gila pottery are found also on the pottery of other regions in the Southwest; the writer has yet to find any such figures peculiar to Casa Grande. There are several designs from the Pueblo region which are not found in the Gila area. This is interpreted to mean that culture of the Gila area affected that of the Pueblo region, but was not affected by it.

FIG. 44. Fragment of burnt clay having lines incised in surface.

The decoration consists mainly of terraced and zigzag figures, but broken spirals are also represented. The so-called "line of life," or broken encircling line, occurs on several fragments.

As mentioned, stepped, or terraced, figures are found on specimens from the Casa Grande region, but are not as numerous as on that of true pueblo ruins of the San Juan drainage. Comparatively few figures are fringed with rows of dots, but short parallel lines are not uncommon.

One of the characteristic decorations of pottery found in the ruins along the Gila and its tributaries is the triangle having two or more parallel lines extending from one angle, which form generally a continuation of one side. (Figs. 45, 46.) This design is common also to pottery from the ruins of dwellings along the Little Colorado, most of

which were once inhabited by clans from the northern tributaries of the Gila and the Salt, but is found only sparingly in the northern Arizona ruins and those of New Mexico and Colorado. Among the Hopi ruins no example of this ornament was found at Sikyatki and but one or two at Awatobi.[1]

The triangle design above described is not commonly found on the Mesa Verde pottery and is rare in the Rio Grande region. In the opinion of the writer this may be safely regarded as one of the symbols (figs. 45, 46, 47) of prehistoric pottery derived from southern Arizona; it has been identified as head feathers of the quail, and is found not only on pottery but also on other objects. The outside wall

FIG. 45. Earthenware bowl decorated with triangle pattern.

of the sarcophagus discovered in Clan-house 1 is decorated with a series of these triangles having quail-feather decorations in red pigment.

The use of the swastika [2] in the decoration of prehistoric pottery is so rare that mention of a single specimen from Casa Grande is

[1] Sikyatki pottery shows no signs of Little Colorado influence, a fact which is in harmony with tribal legends, but former contact with culture of the south is evident in Awatobi ceramics, as would be expected. The Piba (Tobacco) clan, that once lived at Chevlon ruin, may have brought from the Little Colorado the triangle design above described. In the Keam collection there are one or two pieces of pottery with this decoration, but their provenance is indefinite—either Canyon de Chelly or Tusayan, two distinct ceramic areas.

[2] This design, now so freely used in the decoration of Navaho blankets, silverware, and other objects, has been found on pottery from ruins on the Little Colorado, and variant forms occur at Sikyatki, but it seldom appears on cliff-house pottery. The old Hopi priests do not give a cosmic interpretation to the swastika, nor do they identify it as a "good luck" symbol. Some of the Pima suggest that it represents the four claws of the eagle.

important. Among all the Indians of the Southwest none surpass the Pima in the number and variety of the examples of this symbol, which is especially elaborate on their basketry. It is used on their pottery also, particularly on specimens made by the Kwahadt (Quahatika), near Quijotoac.[1]

The single example on their pottery and one or two examples on fragments of basketry show that the swastika was not unknown to the Casa Grande people.

One looks in vain on Casa Grande pottery for representations of the feather symbol of Sikyatki, or the "sky band" with dependent bird forms highly conventionalized, symbols so common on prehistoric Hopi earthenware. Likewise absent are the fine geometric figures so well represented in the ceramics of ancient Hopiland. While there is a likeness between the pottery of the Gila drainage and that of the Little Colorado and the Colorado Plateau, there is only the

FIG. 46. Triangle design decorating bowl (see fig. 45).

most distant resemblance of the life figures of the pottery first named and that of the San Juan and Rio Grande areas.[2]

The relative predominance of geometric figures in Casa Grande ceramic decorations allies the ware to that of the San Juan and Rio Grande drainage rather than to the pottery of the ancient Hopi and Little Colorado. In the old Hopi ware life forms predominate over geometric figures, as may be readily seen by an examination of the

[1] A comparison of modern Pima pottery with ancient Casa Grande ware does not reveal a very close resemblance in symbolism, but the collection of the former is too small to serve as a basis for extensive studies. Modern Pima ware is marked by the presence of but few life forms, while many geometric decorations (bands, straight and curved, and a number of other designs) are used. Terraced designs, so common on Pima pottery, are not utilized to any considerable extent on Gila ware.

The Kwahadt, a group of Indians related to the Pima, living south of Casa Grande, seem to have preserved to a greater extent than the Pima or the Papago the ancient potters' art, although the Pima are good potters. Kwahadt pottery has a fine luster, which is not found on the Casa Grande ware, and bears characteristic symbolic decorations. The designs on this pottery differ radically from the symbols on Pima pottery and basketry, and often suggest symbols on ancient vessels from Casa Grande, combined with features taken from other tribes.

At the present day Sala (Sarah) Hina, of Kwahadt ancestry, is regarded as the most expert Pima potter. She spent considerable time at Casa Grande while the excavations were in progress and copied many designs from the ancient ware.

[2] Although we might predict that the pottery of the Verde and Tonto Basins closely resembles that of the Gila, no assertion as to the resemblance can yet be made, as there are no collections of pottery from these river valleys.

beautiful bowls and vases from Sikyatki, Awatobi, and Shongopovi. Life motives predominate also in pottery from the Little Colorado region, but they are rare in cliff-dwellers' pottery, where the proportions are reversed.[1]

There is every reason to believe that all the Casa Grande pottery and the decoration connected therewith are the work of women, and the industry still survives in feminine hands among both Pueblos and Pima. In a pueblo such as Sikyatki, where symbolism in prehistoric times reached highest development in the Southwest, we find a great predominance of bird designs, but in the Casa Grande pottery there are only one or two such patterns.

A number of the more striking specimens of pottery from the Pueblo Viejo Valley are figured in color elsewhere.[2] Stray specimens of Gila Valley ware are found in the ruins along the Little Colorado, where, however, it is not indigenous. Many fragments, most of which bear geometric designs, were brought to light at Casa Grande, but no life forms with exception of a bird's head in relief on a small fragment (fig. 41).

FIG. 47. Design decorating vase.

The designs on the Pueblo and other Southwestern pottery, ancient and modern, are decidedly idealistic rather than realistic. The life forms rarely represent real animals but rather those which the native potters conceived of as existing. The varied pictures of living beings which, as already stated, constitute so important a feature in the decoration of Sikyatki pottery, were not copied from nature but are highly conventionalized.[3]

Although some of the common symbols, as the rain cloud, which can be recognized without difficulty among the Pueblos, have not yet been traced among Casa Grande decorations, it may be that water symbols of another kind were regarded as more important. The fields of the Casa Grande farmers were watered by irrigation, and

[1] In modern Pueblo pottery life forms play a conspicuous rôle, as may be seen by examination of modern Keres or Tewa ware.

[2] In *22d Ann. Rep. Bur. Amer. Ethnol.*

[3] The symbols on Sikyatki ceramic objects were undoubtedly made by women and it is probable that they understood their significance. These symbols afford a good idea of woman's prehistoric art in one locality of our Southwest and show that it is conventional in the highest degree and largely mythologic, two features that characterize the art products of other Pueblos.

although rain ceremonies were no doubt common, the river cult may have been more prominent. There are reasons to believe that the plumed serpent was to them symbolic of the Gila and it is possible that zigzag figures employed in decorating their pottery have reference to this animal.[1]

BEAMS AND RAFTERS

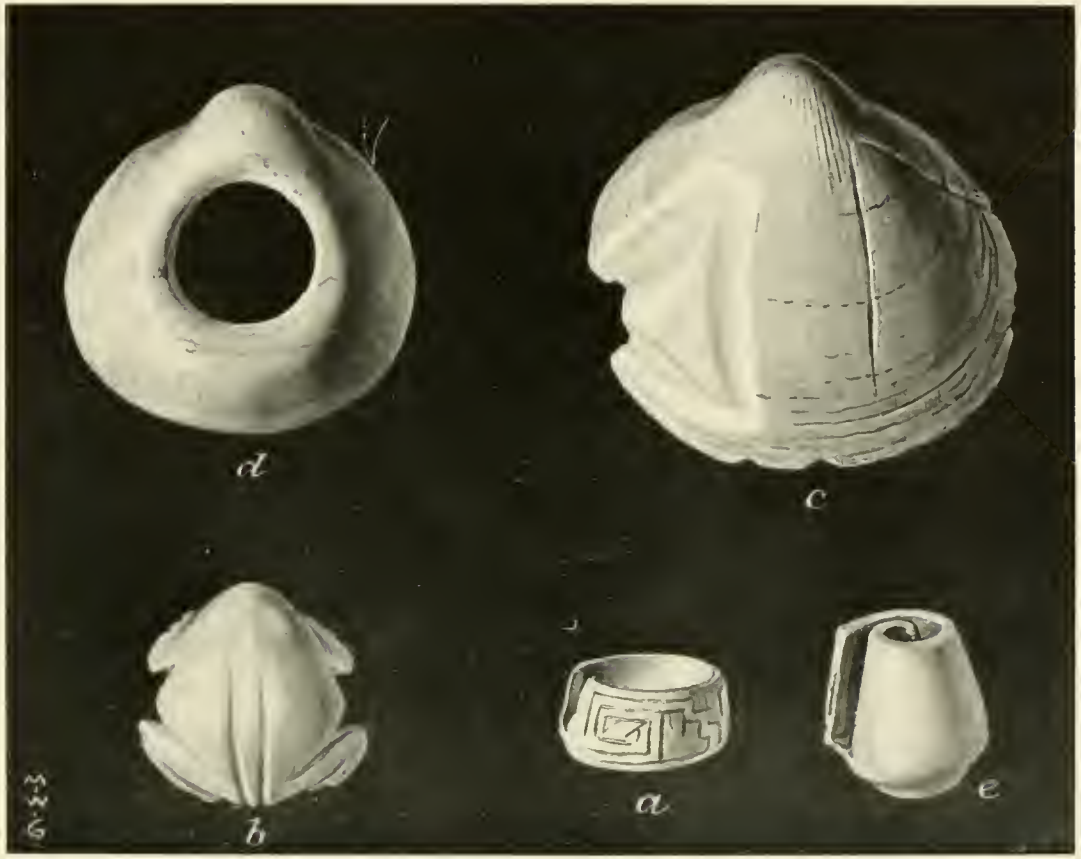
The roof of a section (room H) of the Northeast Building having fallen in almost entire, the writer was enabled to ascertain the manner in which roofs and floors were constructed. The construction of the former seems to have been not unlike that of Pueblo houses. On the rafters, transversely, were placed cedar poles over which were laid sticks supporting clay firmly stamped down. Several fragments of adobe from roofs and floors, showing impressions of logs, branches, and reeds, are in the collection brought back to Washington. Many of the poles and rafters in this building show the effects of fire, being superficially charred or, in some cases, converted completely into charcoal.

While the roof was supported for the greater part by beams laid from wall to wall, it was strengthened by perpendicular logs set in the floors of the rooms. The holes in which these supports were placed were found to be filled with decayed remnants of the logs. Some of these logs must have been dragged from the forests on distant hills.

CANE CIGARETTES

Along the Gila River in prehistoric times and long after the discovery of Casa Grande there grew great quantities of a species of reed out of which the ancient Gileños made cigarettes, by filling short sections, generally between nodes, with tobacco. Some of these sections are found wrapped with fragments of cotton and in most instances they are charred. It would appear that when these cigarettes were used, the smoke was blown through them. An unusually large number of these canes was found in one of the six ceremonial rooms that extend from the northeast corner of Casa Grande to the north wall of Compound A. Cigarettes were unearthed also in rooms of Compound A, but not in Compounds B, C, and D. They are found also in shrines, in the hills north of Casa Grande, not far from Superstition Mountains. They may be considered sacrificial

[1] The Hopi cult of the plumed serpent is said to have been derived from Palatkwabi, the land of the giant cactus. The writer has seen vases from Casas Grandes in Chihuahua on which are depicted serpents bearing horns and feathers on their heads, like those introduced into Walpi by the Patki clans of the Hopi.



SHELL CARVINGS

a, Incised finger-ring (No. 254551); *b*, frog (No. 254544); *c*, *Pectunculus* shell, showing incipient frog carving (No. 254543); *d*, perforated *Pectunculus* shell (No. 254541); *e*, truncated *Conus* shell (No. 254572).

objects, deposited because they had been used for ceremonial purposes. This form of ceremonial cigarette has been discovered in some of the ruins along the Little Colorado and is still used among the Hopi in kiva exercises, although now almost wholly superseded by cigarettes wrapped in cornhusk.

A small dish containing native tobacco (*Nicotiana attenuta*) was found in one of the rooms.

SHELL OBJECTS

From the number and variety of marine shells found in the excavations at Casa Grande it is evident that the ancient inhabitants prized these objects and either obtained them directly from the seashore, or carried on an extensive trade in them with other tribes. All the genera of marine shells found are indigenous to the Pacific Ocean or the Gulf of California; there is not a single specimen that can be traced to the Gulf of Mexico. These shells in prehistoric times must have been widely distributed, for they are found throughout Arizona and New Mexico and far into Chihuahua. We find the shells both entire and cut into various ornamental forms, in imitation of birds, reptiles, frogs, and other animals, the specimens in the last-named group presenting fine examples of art in shell.

The esteem in which shells were held is explained in part by their supposed magic power to bring rain, while the great brilliancy of the pearly layer of certain genera, as the abalone, or ear shell[1] (*Haliotis*), made them especially attractive ornaments.

The most common genus of mollusk found at Casa Grande is *Pectunculus*, the Pacific Coast clam, which was cut into a variety of ornaments, among which may be mentioned wristlets, armlets, carved frogs, and ear pendants. The largest specimens of *Pectunculus* were always chosen for armlets, the smaller being made into wristlets. Armlets were prepared by grinding down the convex surface, leaving a rim about the knob, which was perforated. As many as seven of these armlets were found on the humerus of a single skeleton exhumed from a mound near Compound B. Some armlets and bracelets (see fig. 48) are ornamented exteriorly with incised lines into which were rubbed colored paints, as red and yellow. The surface of one of the most beautiful specimens of incised finger rings was thus decorated with red figures representing rain clouds and lightning. This specimen (pl. 75, *a*) is large enough for the middle finger of an adult; it was found, together with bones of a human hand, in a grave. (See also fig. 49.)

[1] Specimens of this shell were found entire and in fragments; some of the latter were cut into ornaments and perforated.

Several specimens of *Pectunculus* were perforated in the middle, but were not sufficiently ground down to make bracelets or armlets. These, which were found near the base of a human skull, may have been parts of necklaces or of strings of shells worn about the neck, resembling those which have been described from ruins in northern Arizona.

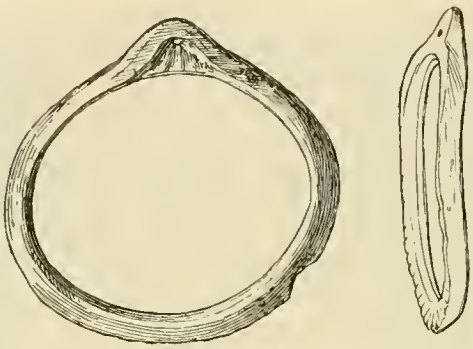


FIG. 48. Bracelet of *Pectunculus* shell.

An artistic example of shell carving found at Casa Grande represents a frog cut out of a *Pectunculus*. In this specimen (pl. 75, *b*), which is one of the best shell carvings known to the author, from the Southwest, the legs, head, and body are in relief, the eyes especially being artistically made. (See also fig. 50.)

One specimen (pl. 75, *c*) of these shells explains how the frogs were made. The legs and arms are indicated by scratches on one side, the backbone of the animal also being marked out by scratches on the surface of the shell. These markings were followed in cutting out the parts of the body.

FIG. 49. Shell finger ring (*Conus*) decorated with incised design.

Several perforated *Pectunculus* shells (pl. 75, *d*) similar to those found in Little Colorado ruins were brought to light at Casa Grande.

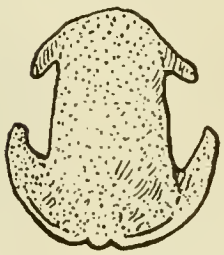


FIG. 50. Shell frog.

A single shell fragment, bearing on the back remains of rows of turquoises, was also found at Casa Grande. Although it would appear from several broken specimens that turquoise mosaics representing animals were not uncommon in the Gila-Salt region, it is doubtful whether these remarkable objects were manufactured in Arizona.[1]

Among the more numerous marine shells which were found in Compound B of the Casa Grande Group of ruins are many large conchs, the points of the spires of nearly all of which were ground off and perforated as if for trumpets. Judging from known ceremonies of the Hopi, it is highly probable that these trumpets were used in dramatic celebrations in which effigies of the great serpent were introduced, the priest using the instruments to imitate the supposed roar of this animal. More than a dozen complete specimens, and many

[1] The turquoise frog found in the ruins at Chaves Pass is figured in *23d Ann. Rep. Bur. Amer. Ethnol.*, pl. XLIV.

fragments of conch shell that may have been parts of trumpets, were found in the course of the excavations at Casa Grande, the greater number being obtained on the west side of Compound B. All these shells came originally from the Pacific coast.

In addition to the worked shell objects mentioned above, there were found a few fragments carved to represent various animals, among them lizards, birds, serpents, rabbits, and certain creatures the identification of which is impossible. Similar small shell carvings exist in all collections from the Gila ruins and are classified as fetishes. These small carvings, which give evidence of considerable artistic skill, were apparently personal amulets. Several had evidently been worn, many being perforated as if formerly suspended about the neck or fastened to the ears or to some other part of the body. These were picked up on the surface, apparently having been washed out of the ground by rains. The number found was comparatively small.

Other shell fragments and shell objects vary from small perforated disks to spherical or oval beads or small flakes. No cord was found by which these beads were strung together.

Shells of the genus *Conus* (pl. 75, *e*) were cut into tinklers, which were either attached to sticks, forming rattles, or to the edges of kiltlike fabrics or garments. These objects were made by cutting off one end of the shell, generally the pointed extremity; in some cases the whole spire was removed and the pointed end perforated, the shell thus becoming a conical bell open at the side. The tinkling was produced by rattling several of these attached shells against one another.[1]

It was suggested by one of the old Pima that the lip of the *Pecten* shell was used in making zigzag or other designs on the cheeks, which had previously been covered with pigment. The shell, he explained, was drawn down the cheek, its lip being pressed against the skin. Nearly all the Pima formerly painted their faces for ornamentation or for protection against the rays of the sun.

BONE IMPLEMENTS

A comparatively small number of bone objects was found, most of them very good specimens. One of the best was taken from the collar bone of an adult, having been placed on the shoulder with the point toward the heart. While most of the bone implements are needles, awls, and pins, this object has been identified as a dirk.

[1] Rattles of this kind are abundant in ruins north of the rim of the Mogollones and are still used by the Hopi and other Pueblos. We sometimes find shells replaced by tinklers made of metal, the best known examples of which are those on the margin of the kilts of the Snake priests at Walpi.

A tube made of a turkey bone perforated about midway in its length was doubtless used as a whistle. It is similar to objects used by the Hopi in some of their ceremonies, to imitate bird calls. Several artificially pointed bones are charred at the end.

Among the bones recognized are those of the antelope, turkey, rabbit, and bear. Bird bones are the most common, but the specimens have been worked to so great an extent as to make identification impossible. Most of them are simply pointed, rarely decorated, but some are perforated for use as beads or needles.

WOODEN IMPLEMENTS

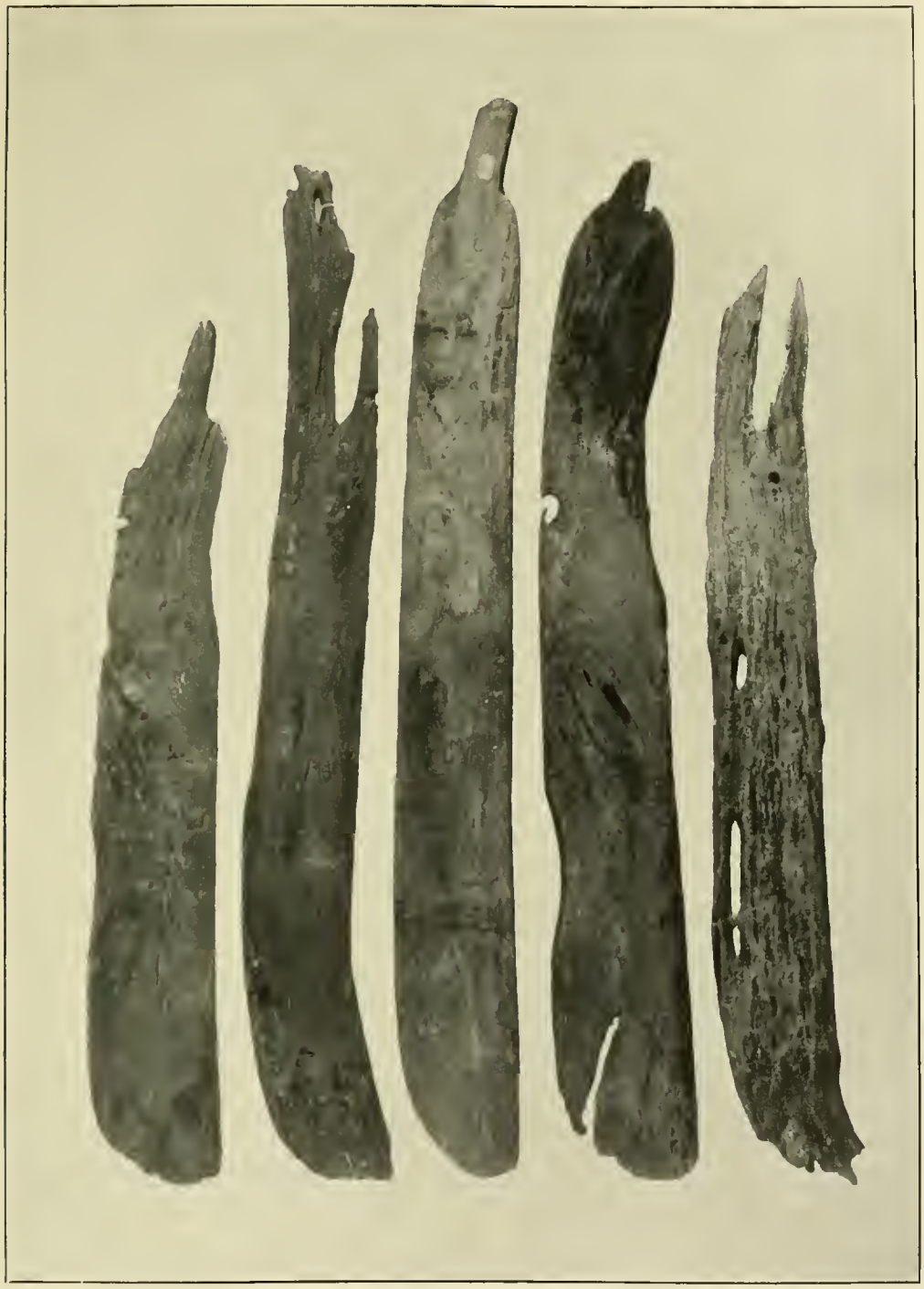
Although there were few trees suitable for building purposes in the immediate neighborhood of Casa Grande, in the distant hills were trees of sufficient size to yield good boards. In rooms which have been excavated are found long beams of considerable size and flat boards the surfaces of some of which are as smooth as if they had been planed. Some of these beams may have been hauled to Casa Grande from localities at least 5 miles or even farther away; they are squared and their surfaces bear evidence of having been worked. They were extensively used to support roofs and floors and in some of the smaller buildings as studding for the walls. In the latter case they held in place withes or osiers upon which was laid the plaster. The trees most commonly used for this purpose were the pine and cedar.

Ironwood, which is very hard and extremely difficult to cut, was shaped into planting sticks for cultivating the soil. These (pl. 76) are saber-shaped, being long and thin-bladed; most of them are provided with a short handle at one end, while the curved rim is sharpened. In one of the rooms of Compound A[1] was a pile of five of these objects[2] averaging 4 to 5 feet in length, that had evidently been deposited there when the place was deserted. Dibbles and planting sticks were found also in excavations, especially in the mound south of Compound B.

Several very good specimens of paddles (pl. 77) of ironwood, of practically the same shape as modern Pima pottery paddles, were unearthed at Casa Grande; these vary in form, some being knife-shaped, others spatulate. They were evidently used in the manufacture of pottery, for finishing the outer surface of the vessel. As

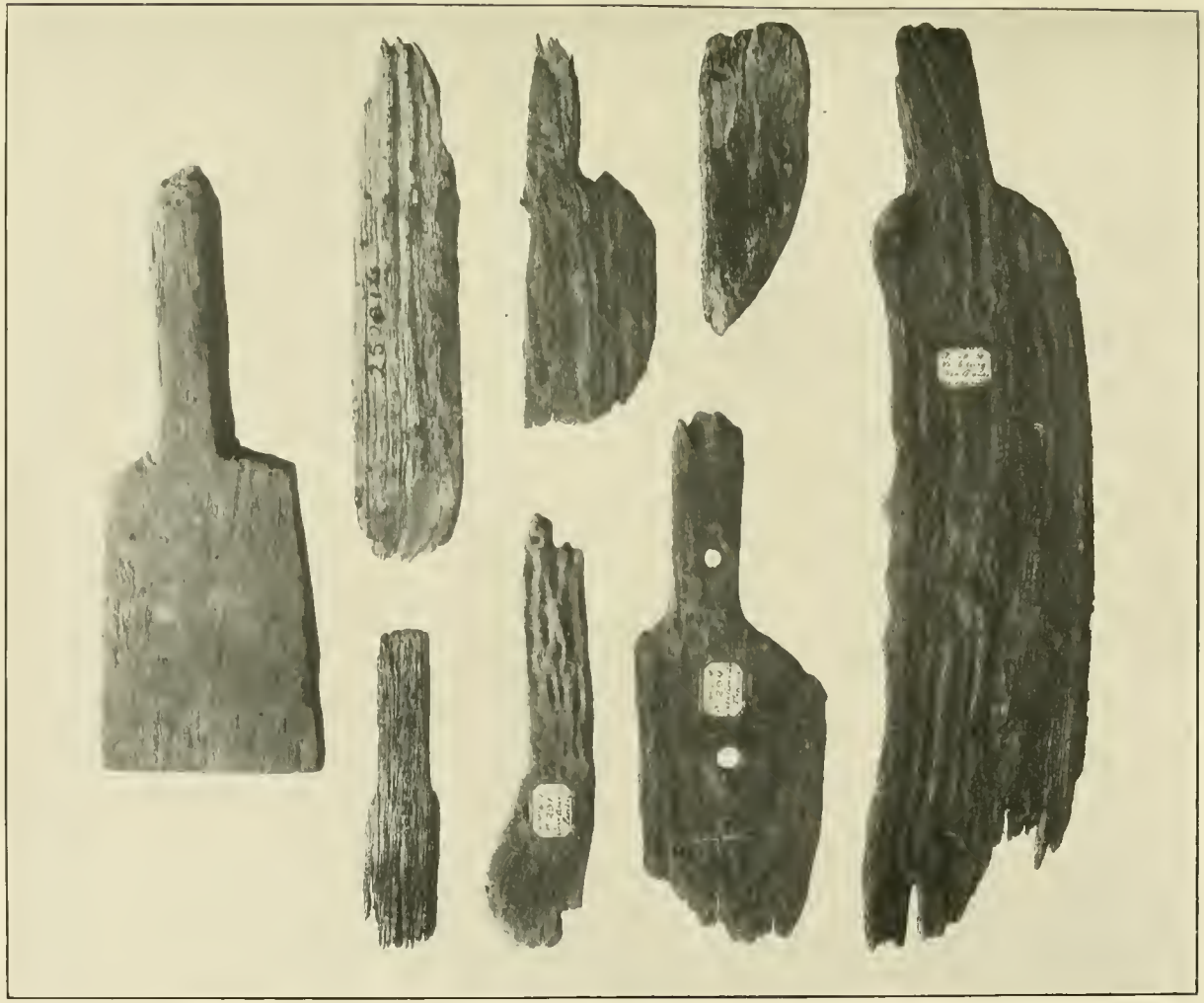
[1] See ground plan of room 1, near northeast plaza (pl. 6).

[2] There was some difference of opinion among Pima workmen and others regarding the use of these implements, but the statement of the older men that in their youth they had seen similar objects used as shovels is accepted as the most probable explanation. Another theory, that they were implements used in war, after the manner of broadswords, is rejected on account of the exceptional character of such weapons among the Southwestern tribes.



(Nos. 252134-252138)

WOODEN SHOVELS OR SPADES



WOODEN PADDLES

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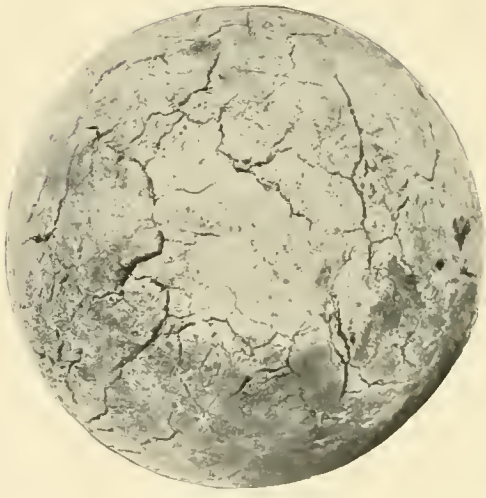
WOODEN STAMP



BALL USED IN KICKING GAME

MODERN OBJECTS FOUND ON SURFACE

there is no evidence whatever that the ancients of Casa Grande had knowledge of the potter's wheel, paddles of this kind were necessary. Smoothing was likewise accomplished by means of stones, after the clay had dried, in the same way that the fine glossy surface is often imparted to earthenware by modern Pima potters.

Among other wooden objects are small pointed sticks of ironwood, a few inches long, which served probably for needles, possibly for weaving. Decayed fragments of a prayer-stick painted green also came to light; this was used possibly in prehistoric ceremonies.

The two objects shown in plate 78 were found on the surface and are modern. The ball was used possibly in the ball game, which is still played at times by the Pima.

BASKETRY

The women of Casa Grande were skillful basket makers. Many fragments and several small whole pieces of their work have been found in the excavations in the houses. The specimens of Casa Grande baskets obtained are of two kinds, one of which is loosely woven of willow twigs, flat in form, more like a Hopi plaque than an ordinary basket. While varying in size, most of these baskets are quite large, the remains of one indicating so great a capacity that it might have been used as a bin for the storage of corn or other grain in much the same way that a similar granary is used by the modern Pima. The other type of flat basket belongs to the coiled variety, being made from the fiber of raffia wound over bunches of the same material. Most of these baskets are small and bear evidences of ornamentation, the strands of which they are composed being variously colored. One specimen of this type was found covered with a thin deposit, possibly pitch, as if to render it serviceable as a water jar. Similar waterproof baskets are not uncommon among the Apache and other Indians of northern Arizona.

A large fragment of coarse matting was unearthed in one of the rooms; this is evidently part of a mat that was used in much the same way as the ancient Pima used their sleeping mats. Impressions of one of these mats were seen upon the adobe floor of one of the rooms of Compound B, elsewhere mentioned (p. 99). These mats were made of a rush which, according to historians, formerly grew abundantly along the banks of the Gila and Salt Rivers, but which in late years has become rare in the vicinity of Casa Grande.

FABRICS

From the number of fragments of cloth excavated at Casa Grande there is little doubt that the prehistoric inhabitants of this settlement

were familiar with native cotton and had also fabrics made of other vegetable fibers.[1] They likewise wove the hair of certain animals into articles of wearing apparel. Of all varieties of fiber used in weaving the most abundant and most readily obtained was that of the agave, which grows luxuriantly everywhere in southern Arizona deserts. A combination of this fiber with that of cotton was common, and the manufacture of feather garments was not unknown. A small skeleton found in one of the rooms was wrapped in a garment of this kind and in another room similar wrappings were found around a small bowl containing green pigment. There were unearthed also fragments of a belt decorated with rectangular and zigzag patterns, similar to designs on fabrics discovered among cliff-dwellings in northern Arizona; one end of this belt was embroidered. Worthy of mention also is a lace-like fabric, a large piece of which was unearthed in the refuse that formerly almost filled one of the rooms just east of Casa Grande. On account of the great heat, thick clothing was not made by the people of this community.

FIG. 51. Copper bells.

COPPER BELLS

The inhabitants of Casa Grande appear to have been ignorant of all metals except float copper, a specimen of which was found in the excavations (pl. 67, *f*). Two copper bells (fig. 51) were picked up on the surface of the ground. These bells do not differ in shape or size from those found in ruins along the Little Colorado and elsewhere in the Southwest and may have been obtained in trade from Mexico, although there is no evidence that they were not made by the Casa Grande people.

PICTOGRAPHS

Casa Grande is situated in a plain and in the immediate neighborhood there are no outcroppings of rocks available for pictographs, although it is probable that certain pictures on rocks distant about a mile date back to the time when Casa Grande was inhabited. As a rule, these pictographs are pecked into the rock, paintings, if any, having been washed or worn away. The largest cluster of pictographs lies in the outcropping lava on the north side of the Gila, opposite the settlement of Pima, called Blackwater.

There are also many pictographs on the "pictured rocks" a few miles east of Florence, and still others in the Casa Grande Mountain

[1] Many of the fragments of cloth found were charred, and on that account some of the best specimens fell to pieces when handled.

Range west of the ruins. The pictographs near Sacaton are perhaps the best known in this section, although those farther down the Gila are more extensive. There is a general similarity in all these picture writings, some of which are regarded with reverence by modern Pima.

The pictures impart but slight information respecting the life or customs of the prehistoric people who made them, being much the same as pictographs found elsewhere in the Southwest. Symbols that may be clan totems or even rude representations of mythologic beings are found in the neighboring hills; these may indicate camping places, shrines, or other sites, but beyond this we can offer no suggestion as to their meaning. They tell no connected story of the ancients.

FIG. 52. Incised pictograph of "the House of Tcuhu."

The walls of Casa Grande formerly bore names of many American visitors and a few markings that can be ascribed to Indians. One of the best of these, shown in the accompanying illustration (fig. 52; see also pl. 40), is sometimes called *tcuhuki*, or "the house of Tcuhu." Its resemblance to a figure in an early Spanish narration has been commented on elsewhere.[1] Several pictographs found in the vicinity of Casa Grande are also shown in plate 40.

In a speech in the House of Representatives (Mar. 2, 1865) Colonel Poston said:

> The oldest living trapper in Arizona, at this day, is old Pauline Weaver, from White County, Tennessee. His name is carved on the Casa Grande, near the Pima villages on the Gila River, under date 1832.

Although not disposed to doubt that Weaver may have visited the ruin at that early date, the writer has not been able to find his name or the date on its walls.

[1] See *American Anthropologist*, N. S., IX, 512, 1907. The account previously quoted from the Rudo Ensayo is that here referred to. The *tcuhuki* was not a ruin, as the author understood the Pima, but a game in which the figure mentioned was marked out on the sand. This game, now about extinct, has been played within the memory of one of the writer's informants.

SEEDS

In one of the rooms east of Casa Grande were found seeds of several kinds—corn, beans, and mesquite beans. The corn grains were often encountered in masses, generally charred, some being so much burnt that they were recognizable only with difficulty.

Some of these seeds were found in pottery vessels, many of which were in fragmentary condition; most of this pottery came to light in the rooms east of the main building of Compound A, which was evidently used as a dumping place long after the rooms were abandoned. The presence of many fragments of textiles, pottery, corn stalks and leaves, charcoal from sticks or beams, and ashes in quantities suggested that possibly fires were once built here.

RELATION OF COMPOUNDS TO PUEBLOS

The architecture of the compounds of the Gila-Salt Basin is sufficiently characteristic to distinguish them from pueblos, making possible the assumption that the sociology of the peoples was also different. In compounds and pueblos we recognize buildings of at least two types, apparently devoted to two distinct purposes, secular and ceremonial. The homologue of the massive house with its surrounding wall is unknown among pueblos, and the *kiva* of the latter is not represented architecturally in the Gila Valley ruins.[1]

It is instructive to note that the ruins in the valley of the Little Colorado, where the influence of the Gila Valley culture was marked, contain no true kivas. Their ceremonial rooms were *kihus*, morphologically different from, although functionally the same as, kivas. The Zuñi *kiwitse* architecturally resembles a kihu rather than a kiva, and is probably a survivor of the ceremonial room of the Little Colorado ruins. Among the Hopi there are both kivas and kihus, the former traceable to northern and eastern influence. The reason kivas have not been found in the Little Colorado drainage is that there the ceremonial rooms were kihus, which are difficult to distinguish from other rooms in the house masses.

It is hard to reach a definite conclusion regarding the relative ages of the Gila Valley compounds and the pueblos of northern Arizona, or to compare as to age the Arizona ruins with those of New Mexico and Colorado. If we rely on traditions for that comparison, they teach, in the opinion of the writer, that both are older than the Little Colorado pueblos, to which group the Zuñi ruins belong.

[1] These two architectural forms of Pueblo ceremonial rooms are so different that one can hardly have been derived from the other. They are analogous but not homologous, and their relations are difficult to determine.

Culturally, all northern[1] and central Arizona ruins, ancient and modern, seem to show a dual composition, having connections on the one side with the Rio Grande pueblos and on the other with the habitations of the Gila Valley. Whether the pueblos of New Mexico in the Rio Grande drainage were derived from the compounds of the Gila or vice versa, is an open question, but there seem to have been two foci of cultural distribution in the Southwest.

Hopi traditions support the theory that the ruins in the Verde and Tonto Valleys were settled by offshoots from the "great house" builders of the Gila and Salt Valleys in prehistoric times, and that the ruins along the Little Colorado were peopled in part by clans from the same river valleys. There appears to be no way of ascertaining the sources or the relative age of the Rio Grande culture, whether derivative or autochthonous.[2]

The geographic limits of the ruins called "compounds" appear to be the plains of the Gila-Salt Basin. Following up the tributaries of the Gila-Salt, these ruins give place to pueblos and cliff-houses, and even where there are extensive plains, as in the Little Colorado Basin, the construction of "great houses" like Casa Grande does not appear to have been undertaken. The so-called Casas Grandes ruins in Chihuahua, however, belong to the same type as the compounds in the Gila-Salt Valley of Arizona, although larger and apparently more ancient. The environmental conditions of the deserts of southern Arizona and northern Mexico, like the ruins, are quite similar.

Although without kivas, the cliff-houses in the Sierra Madre of northwestern Mexico resemble in many features those of Arizona, Colorado, New Mexico, and Utah, and stand in somewhat the same relation to the *casas grandes* along the river of the same name as do the cliff-dwellings near Roosevelt Dam to Casa Grande. This indicates the existence of a homogeneous culture, and shows that, where similar environmental conditions existed, the inhabitants constructed similar dwellings. By this method of reasoning, the conclusion is reached that the Sierra Madre and the Arizona cliff-dwellings were not derived one from the other, but arose as independent modifications of a similar culture.[3]

Thus, it would appear that while architecturally there is considerable difference between the compounds and the pueblos, some of the latter may have housed descendants of the inhabitants of the former None of these pueblos, however, are found in the neighbor-

[1] Except possibly those on the San Juan and its tributaries.

[2] There is evidence that some of the oldest Hopi villages were settled by clans from this region.

[3] The circular subterranean kiva, so constant a feature of the cliff-houses of northern Arizona, southern Colorado, and the Rio Grande and San Juan drainage, does not exist in the cliff-houses of southern Arizona, nor in the Sierra Madre in Mexico. This form is not found in the cliff-houses of the Red Rocks, on the Verde, or on any tributary of the Gila; it originated in the eastern part of the Pueblo area, and its influence was not sufficient to be felt in any prehistoric pueblo on the Colorado River.

hood of the "great houses" of the Gila-Salt Basin; there are no modern pueblos in southern Arizona. When Europeans entered the Gila Valley they found tribes living in isolated dwellings not very different from the houses of modern Pima and Papago, who are supposed to be the descendants of the builders of Casa Grande.

The appearance of the great walled compounds like Casa Grande suggests the warlike rather than the peaceful character of the inhabitants. They were constructed for defense and their presence implies that their builders had enemies they feared. It is hardly possible that any considerable number of distant enemies could have menaced Casa Grande at the time this structure was built, but its inhabitants were fearful of their own neighbors, of warriors of their own stock, perhaps speaking their own language. Judging from what we know of the Pueblos, there was little unity of action among the people of the compounds. The conditions were feudal, each community for itself; the people did not unite to resist a common foe. Constant raiding led to a union of related clans, which erected thick-walled dwellings for protection. Possibly something akin to what has been called the "megalithic era" influenced these ever-growing communities. The "unconscious aim at expression of abstract power" by huge buildings may also have had its influence. An American feudal system developed in the Gila-Salado Basin, marked by the erection of buildings belonging to some chief (*civan*), around which were clustered small huts in which the common people lived. There was nothing like this condition among the Pueblos or even probably among the cliff-dwellers, but such a condition existed in Mexico in the days before the advent of the European conquerors.

But if it be true that ancestors of the Pima built Casa Grande, why, it may be asked, have the Pima lost the art of building "great houses," and why did they inhabit only small huts when the Spanish explorers came?[1] In reply it may be said that they were forced to abandon their great structures, being unable to defend them on account of their unwieldy size. Hostile invaders found these conspicuous structures easy prey and broke up this phase of Pima culture, overcoming the chiefs and driving out the defenders of the compounds. But, although scattered, the common people naturally continued to occupy inconspicuous huts similar to those in which they had always lived. (See fig. 53.) This apparent change of culture is paralleled among sedentary tribes in Mexico. Although forced to desert their temples and great buildings, the ancient Mexicans still lived in huts, in which nothing remained to tempt the cupidity of their enemies.

[1] "Great houses" are said by Bandelier, quoting Father Ribas (Final Report, pt. II, p. 460), to have been occupied by southern Pima in historic times.

Summary of Conclusions

The preceding conclusions may be summarized as follows: In ancient times the whole drainage of the Gila and its tributaries from the points where they leave the mountains as far at least as Gila Bend was inhabited by an agricultural people in a homogeneous stage of culture. Throughout this region existed minor divisions of a common stock. The Pima name Hohokam may be adopted to designate this ancestral stock, to whom may be ascribed the erection of the *casas grandes* on the Gila. These "great houses" were places of refuge, ceremony, and trade. They were inhabited and ruled by the chiefs whose names they bear among the present Pima. The

Fig. 53. Model of Pima circular house constructed south of Compound A.

people dwelt in small huts of perishable character, not unlike Pima *jacales* of historic times, a few of which still survive. In the course of time a hostile faction bent on pillage came into this region from east or west and drove the agriculturists out of their *casas grandes* or at least broke up the custom of building such structures. But although dispersed, the ancient house builders were not exterminated; some of them became refugees and migrated south into Mexico, some followed the course of the Verde and the Tonto into the northern mountains, but others, perhaps the majority, gradually lost their former culture but still remained in the Gila Valley, becoming ancestors of the present Pima, Papago, and Kwahadt (Quahatika). Those who went northward later built pueblos (now ruins) in the Little Colorado Valley.

Their descendants ultimately joined the Zuñi and the Hopi, with whom, according to legends, they still live.[1]

Historians have paid little attention to these migrations, for they occurred in prehistoric times, but vague legends still survive among both Zuñi and Hopi bearing on the life of some of their clans in the south. These migration legends are supported by archeologic evidence and are supplemented by Pima traditions.

One objection that has been repeatedly urged against acceptance of the traditions of the modern Pima that they are descendants of the inhabitants of Casa Grande is that the former do not now construct great massive-walled houses like the buildings here described, but

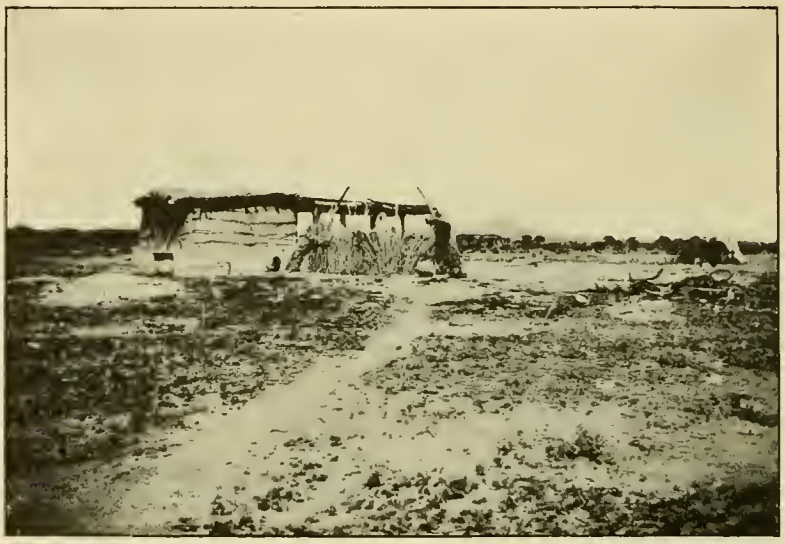


FIG. 54. Typical modern Pima rectangular dwelling.

live in thin-walled houses supported by posts. The Pima have not constructed habitations of the former type in historic times. The excavations in Compound B show that many fragile-walled houses of rectangular form once stood within this inclosure and there is good evidence that they existed in the other compounds also. The people of Casa Grande, or at least some of them, inhabited the same kind of houses as the modern Pima. These great buildings are not habitations; they are sacred edifices or communal citadels. But it may be objected that the typical Pima houses were round,

[1] These legends call for new researches on the character of the prehistoric culture along the northern tributaries of the Salt River, the Verde, the Tonto, and other streams. Accurate information on the following, among other, points is needed: (1) What relation exists between the symbolism on pottery from these valleys and on that from the Gila and the Little Colorado? (2) Was cremation practised along the Verde and the Tonto in prehistoric times? Is there any evidence of cremation in ruins on the Little Colorado?

while those of Casa Grande were rectangular.[1] (Figs. 53, 54.) This objection at present seems unanswerable, but attention may be drawn to the fact that some of the Pima dwellings are rectangular. Objection is made also because of the difference in the manner of disposal of the dead. As is well known, the Pima do not burn their dead, whereas cremation was a common custom at Casa Grande. Evidence has been presented already, showing that the inhabitants of Casa Grande sometimes interred their dead as well as burned them and that both customs existed side by side in the same compound.

In traversing the Gila region one finds mounds of earth, reservoirs, and remains of irrigation ditches similar to those above considered. Examination of these structures reveals a morphologic resemblance which leads us to regard this region as a single culture area. On comparison of the architecture of Casa Grande with that typical of cave or pueblo constructions the differences seem to be so marked that they can not be included in the culture area of which the first-named style of architecture is a type. The Pueblo culture area is architecturally different. But when Casa Grande is compared with buildings farther south, including those in the northern States of Mexico, striking resemblances appear. The Gila Valley culture area is limited on the north by the plateau region, but extends to an as yet undefined border on the south.

There are similar limitations and extensions in physiographic conditions. The environment changes as we pass out of the culture area of which Casa Grande is a type into the region of Pueblo culture. It is not illogical to suppose, therefore, that Casa Grande affords another striking example of intimate relationship between human culture and environment, under a law intimately connected with a more comprehensive one, namely, the relation of geography and human culture history.

As pointed out by the late Doctor Russell, the Pima have legends that they came from the east, but he does not state that all the Pima clans have identical legends. Some clans claim that their ancestors built Casa Grande; here the legends may refer to those clans living in the Gila Valley before the arrival of the eastern contingent mentioned by Russell. Like most of the Southwestern tribes, the modern Pima show evidences of being a composite tribe and it is not unlikely that ancestors of some of the components may have come from one direction, others from another. The craniologic differences between the builders of the Gila-Salt compounds and the modern Pima may be accounted for by this fact.

[1] None of the wattle-walled huts, the floors and decayed posts of which can be so well traced in Compound B, were circular in form. When the Pima were first visited nearly all their huts were circular. Only a few of this type now remain.

In the light of the various objects found at Casa Grande, already described, the inhabitants of the prehistoric settlement may be considered as people of the Stone Age, notwithstanding their acquaintance with copper. There is no evidence that they were familiar with any other metals, as iron, bronze, silver, or gold. But even in this stage they must have developed a comparatively high social organization. Every student of the "great houses" of the Gila-Salado Basin must marvel at their relatively enormous size and the evidences of cooperation and intelligent direction of labor that they show. The erection of such structures requires many workmen and an able director, a sociologic condition not found elsewhere in North America outside of Mexico. In another place the writer ascribes the origin of this cooperation to the necessity of union of labor in the construction of the irrigation ditches essential for successful agriculture in this region, one of many examples that might be cited of the influence of climate on culture history in the Southwest.

These buildings were constructed on a characteristic plan, which was adhered to everywhere in the Gila Valley. As already stated, the builders evolved two distinct types of architecture: "Great houses" with thick walls, apparently constructed by many persons, features which point to these structures as devoted to public purposes; (2) one-room habitations with wattle walls, provided with a central fireplace in the floor, and with a doorway in the middle of one of the long sides.[1]

The presence of stone idols indicates a well-developed idolatry and ceremonial system. While the inhabitants possessed effective weapons in the form of spears, and bows and arrows, they were essentially agricultural, cultivating fields of corn and possibly beans, squashes, and the like. They also gathered mesquite beans.

They wove fibers into belts or into cloth which was colored with bright pigments. They raised cotton and utilized the fibers of agave and other plants in weaving. They made basketry and pottery, which they decorated with symbols, but did not glaze. As potters they were inferior to their neighbors at Casas Grandes, in Chihuahua,[2] and to the aboriginal artists of Sikyatki and Awatobi in the Hopi country. In disposing of their dead they practised both cremation and inhumation.

A conclusion arrived at in the writer's studies of the habitations, sometimes called pueblos, of sedentary peoples in the Southwest, is

[1] It is probable that the doorway served also as a smoke vent, as in modern Pima houses, which are not provided with an opening in the roof.

[2] The pottery from this Mexican State shares with that from Sikyatki and other ancient Hopi ruins, the reputation of being the best painted ware of prehistoric North America, exclusive of southern Mexico and Central America. The relation of the polychrome ware from these two regions is close so far as colors are concerned, but diverse as regards symbols.

that they form two distinct architectural types—the true pueblos and the compounds—differing radically from each other. These indicate two centers of cultural distribution, one of which was in the east, the other in the south, or, broadly speaking, in what is now called Colorado and New Mexico on the one hand, and southern Arizona on the other. Between these centers lies the great valley of the Little Colorado, which was a meeting ground of prehistoric people, wherein a mixed cultural type was formed and distributed. It has a composite type of pottery showing features of the Colorado-New Mexican and the southern Arizonian ware, sometimes one, sometimes the other, predominating.

The aboriginal migrations of man in the Southwest may be roughly likened to the spread of vegetation or to the stocking of regions by animals from a center of distribution. There was a slow passing of clans from one place to another, largely influenced by the scarcity or abundance of water and food. The pressure of incoming hostiles played a part in determining the directions of the migrations, but not the most important part, the main cause being failure of water, due to desiccation of the land, and increased salinity. The situation of streams was an important factor in these migrations, as it determined the location of the trails which man followed. The routes of the prehistoric migrations are indicated by ruins left along the banks of these streams. In these movements sites that could be readily defended were generally adopted, but each group of clans acted independently: there was little unity of action and at times open hostility among members of the same group. Clusters of clans were continually uniting and groups of families were as constantly diverging from the main body. Two great movements can be detected, one setting from the Rio Grande toward the west and south, and the other from the Gila toward the north and east. An objective region for both was the valley of the Little Colorado, which offered an attractive home for all the tribes.

The Grand Canyon of the Colorado, situated north and west of the Pueblo region, served to keep back from the Little Colorado Valley the inhabitants of the country in those directions, so the immigrants entered this region in prehistoric times mainly from the east and south. One stream of colonists followed down the San Juan, another went up the northern tributaries of the Salt. The ruins at Black Falls mark the southern limit of the people passing west and south from the San Juan; those on the Little Colorado above Black Falls can be traced to the southern colonists.

The advent of the southern colonists into the Little Colorado Basin was at a late day; their influence was widely spread. The tributaries entering the Salt from the north served as pathways by which the culture of the south spread from the Gila north and northeast.

Of the various tributaries that have served for the transmission northward of the culture of the Gila-Salt region the Tonto and the Verde were the most important routes. Along their banks are many ruins of former houses of the clans from the south that migrated northward, a few reaching Tusayan, as traditions of the Hopi declare. Mindeleff[1] reached the conclusion, from which the author dissents, that there was a migration in the Verde Valley from the north to the south, as shown in the following quotation:

> The internal evidence supports the conclusion that the movement [along the Verde] was southward and that in the large ruin near Limestone Creek the inhabitants of the lower Verde Valley had their last resting place before they were absorbed by the population south of them, or were driven permanently from this region.

The existence of many large ruins and the small amount of arable land in the southern part of the Verde Valley would seem to indicate that the clans traversed the valley seeking better agricultural lands, the soil improving as one goes north. They crossed the mountains from south to north, eventually descending into the valley of the Little Colorado, which was uninhabited. An examination of the narrow lower Verde Valley shows that it was not fitted for the support of so large a population as that indicated by the remains of the great settlements along the Gila. The ruins of the pueblos built in this region bear inherent evidences that they were not long inhabited; the clans drifted farther north, where the valley afforded better soil and more abundant water. With progress northward the number of ruins increases, showing that the land was more thickly populated and the length of occupancy greater. When the emigrants above mentioned met the eastern clans they became assimilated with them and the farther they went from the Gila the more they lost resemblance to the parent type. The sphere of influence of the southern culture can be fairly well traced, its northern limit being not far from the mesas of the Hopi, who have been somewhat modified by it. It can be traced as far as the upper Verde and extended eastward to the pueblo of Acoma.[2]

The ruins directly ascribed to the southern culture show little influence of Keresan or Tanoan clans but suggest the blocks of buildings in the Gila compounds. These ruins contain no circular subterranean kivas. The pottery of these southern pueblos has characteristic symbols traceable throughout the regions to which its influence extended.

The pottery of the first-settled pueblos of the Hopi, as Sikyatki, is distinctly allied to that of the eastern culture type and shows little resemblance to that from the south. Hopi pottery was never pro-

[1] In *13th Ann. Rep. Bur. Ethnol.*, p. 259.

[2] Pueblo ruins like Kintiel, north of Navaho Springs, show strongly this southern influence and marked resemblance to Zuñi Valley ruins.

foundly affected by clans from that direction. Prehistoric Hopi pottery symbols are Keresan. The influx of Tewa and Tigua in comparatively modern times has radically modified the symbols so that, as elsewhere pointed out, modern Hopi pottery is practically Tanoan.

At Zuñi, however, prehistoric pottery is more closely related to that of the southern clans, by whom the valley was first settled, and belongs to the Little Colorado ceramic area.[1] Modern Zuñi pottery, however, is radically different from the ancient, resembling that of modern Hano or of the so-called modern Hopi.

If, as the character of the pottery seems to indicate, Zuñi culture is more modern than Hopi culture, the earliest colonists in the Zuñi Valley were clans related to those that peopled the Little Colorado Basin later than the time of the founding of Sikyatki and other prehistoric Hopi pueblos.

A comparative study of Acoma pottery sheds no light on the age of Zuñi as compared with that of the abandoned pueblos of the Little Colorado and the ancient Hopi ruins. Very little archeologic data regarding Acoma has been gathered, and few clan or migration legends of this pueblo have been published, but judging from ceramic decoration it appears that Acoma pottery bears little resemblance to that peculiar to southern clans; it is distinctly Keresan and resembles more closely the pottery of ancient Hopi than it does that of ancient Zuñi or Little Colorado ware, by which it does not appear to have been affected. Certain known facts bear on this question. Acoma is the oldest pueblo on an ancient site in the Southwest. Since its settlement it has been in continual conflict with other peoples. When its clans came into the country they were forced to defend themselves and chose as the site of their home a high rock, from which other clans could not dislodge them. Acoma is regarded, then, as the eastern limit of southern, or Gila, influence and marks one point on a line of demarkation of the dual influences which merged at Hopi and Zuñi. According to Hopi legend, it was settled by clans allied to the Snake and the Horn, from Tokónabi on the San Juan, which united with those from the far eastern region, possibly of Keresan parentage, as the present language indicates.

The Hopi Snake legend tells of clans called the Tcamahia that left the Snake clans at Wukoki on the Little Colorado and made their way east to Acoma,[2] where they met other clans from the east. These two groups were kindred, and as Tcamahia is a Keresan term we may conclude that they were Keresan in kin. The relations of the Tcamahia of Acoma and the Snake clans at Walpi were never com-

[1] From the relation of the ancient Zuñi pottery to that of the Little Colorado and the Gila the writer is led to believe that the first colonists of that valley came from the south and west.

[2] In estimating the extent of the influence of Gila Valley culture in the northeastern part of the pueblo region, especially in the neighborhood of Acoma, it is desirable that ruins ascribed to ancestors of Acoma clans be studied in the light of their traditions.

pletely broken, and at every Snake festival one of the Tcamahia from Acoma is a guest. This is the asperger, who chants the words *Tcamahia, Awahaia,* etc.

In considering the prehistoric migrations of agricultural peoples in the Southwest, especially with respect to changes in culture and to diminution of population, we must not lose sight of the influence of increased salinity due, directly or indirectly, to long-continued prehistoric irrigation. This cause was perhaps more effectual than human enemies or increased aridity in breaking up the prehistoric culture. If barrenness of the soil, due to the cause mentioned, led to the abandonment of populous aboriginal compounds, this fact has an important bearing on the future of the white farmers in the Gila and Salt River Valleys.

APPENDIX

CATALOGUE OF SPECIMENS FROM CASA GRANDE

Following is a list of specimens collected from Casa Grande in 1906–7 and 1907–8, prepared by Mr. E. P. Upham, of the United States National Museum, who has introduced measurements of many of the objects. The objects bearing accession number 48761 were obtained mainly from Compound A in 1906–7, and the remainder, under No. 49619, are from Compounds B, C, D, and Clan-house 1, collected in 1907–8. A few specimens were picked up on the surface of the ground between the compounds or dug up in the mounds east and south of Compound B, midway between Compound A and Clan-house 1.

The whole number of specimens obtained is approximately 1,300, exclusive of fragments and objects gathered from the surface, some possibly not belonging to the ancients. The brief references to the Casa Grande specimens in the following lists are supplementary to the more complete descriptions, accompanied with illustrations, of some of the more striking examples that appear in the preceding pages.

Accession No. 48761, Casa Grande, Arizona

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
251669	477a	Fragment of clay vessel with painted bird's head; length, 4¼ inches	1
251670	478b	Wooden pottery paddle; 6¼ x 2½ inches	1
251671	479c	Double-edged stone ax; length, 4¼ inches; width, 2¾ inches	1
251672	480d	Stone shovel; length, 5¼ inches; width, 4¼ inches	1
251673	481e	Stone ball used in game; diameter, 2½ inches	1
251674	482f	Stone paint grinder; height, 2½ inches; diameter, 4 inches	1
251675	483g	Wooden hoe; length, 3 feet 2½ inches; width, 4⅜ inches	1
251676	484a	Pectunculus shell, carved to represent frog (surface); length, 2 inches	1
251677	485b	Clay saucer with three legs; height, 2½ inches; diameter, 5¼ inches	1
251678	486c	Carved stone serpents (surface); length, 2⅛ inches; diameter, 1½ inches	1
251679	487d	Stone slab for paint grinding; length, 3 inches; width, 1⅞ inches	1
251680	488e	Problematical stone (surface); length, 3½ inches	1
251681	489f	Clay bowl; height, 3 inches; diameter, 6½ inches	1
251682	490g	Perforated Pectunculus shell; diameter, 2 inches	1
252001	1	Fragments of pottery	29
252002	2	Earthenware bowl, containing six Pectunculus shells	1
252003	3	Earthenware vase	1
252004	4	Earthenware disks	3
252005	5	Pieces of large earthenware vessel with charred bones of birds and small animals attached	2
252006	6	Pieces of charred shell	2
252007	7	Charred bone implements, fragments of pottery, shells, quartz, crystal, etc	1

Accession No. 48761, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252008	8	Charcoal cylinders, paint sticks	26
252009	9	Mass of charred corn	1
252010	10	Shell, Pecten	1
252011	11	Piece of charred sea shell	1
252012	12	Stone ax, double-bitted, showing effects of fire; length, 5⅞ inches	1
252013	13	Grooved stone ax, showing effects of fire; length, 6½ inches	1
252014	14	Piece of charred beam; length, 14 inches	1
252015	15	Pieces of wooden beams or posts; lengths, 13½, 16½ inches	2
252016	16	Fragments of wooden hoes; Mound 6, east of Compound B	2
252017	17	Stone mortar, slab; 12½ x 10½ x 4¾ inches	1
252018	18	Rubbing stones, mainly rectangular in outline; lengths, 2⅞ to 5½ inches	9
252019	19	Hammer stones, irregularly shaped pieces, with battered edges	11
252020	20	Stone disks, natural forms, some with fractured edges; diameters, 3¼ to 5½ inches	4
252021	21	Stone pestle in form of tapering cylinder; length, 5⅝ inches	1
252022	22	Arrow-shaft polisher (broken); length, 3 inches	1
252023	23	Irregularly shaped natural forms	8
252024	24	Fragment of pottery, leg of tripod vase; length, 2 inches	1
252025	25	Earthenware pot, suspension holes near rim, plain ware; height, 5½ inches: diameter, 7 inches; Mound 6, Group B	1
252026	26	Fragment of earthenware vessel, plain ware	1
252027	27	Earthenware bowl, painted decoration; height, 5 inches; broken but can be restored; Mound 6, Group B	1
252028	28	Fragments of pottery, vases, some decorated; Mound 2, Group B	8
252029	29	Fragments of pottery, handle of vase, decorated	1
252030	30	Shell bead and pendants, Conus	6
252031	31	Concretion; length, 5 inches	1
252032	32	Piece of obsidian (waterworn); length, 5 inches	1
252033	33	Earthenware bowl, plain ware; diameter, 6¾ inches; height, 3¼ inches	1
252034	34	Earthenware bowl, fragment	1
252035	35	Fragments of decorated pottery	1
252036	36	.....do	1
252037	37	.....do	1
252038	38	Fragments of tripod dish (small)	1
252039	39	Clay disks made from broken vessels; 7 perforated, 5 not perforated	12
252040	40	Animal figurine, baked clay; length, 1⅜ inches	1
252041	41	Charred bones, fragments	4
252042	42	Charred shells	2
252043	43	Pitted stone (lava), oval outline; length, 4½ inches	1
252044	44	Pitted stone (lava), globular outline; diameter, 3 inches	1
252045	45	Piece of red ocher (paint)	1
252046	46	Polishing stone; 3¼ x ½ x ¼ inches	1
252047	47	Concretions used as polishers (small)	2
252048	48	Obsidian flake, knife; length, 3 inches	1
252049	49	Piece of bluish clay, paint	2
252050	50	Concretions and quartz crystals	8
252051	51	Digging tools of iron[1] (spade-like); length, 7 inches; (evidently Spanish: not prehistoric)	2
252052	52	Mealing stone; 7 x 4 x 2 inches	1
252053	53	Hammer stones; lengths, 3½ and 3¾ inches	2
252054	54	Rubbing stones, small, lava; lengths, 3 and 3¾ inches	2
252055	55	Piece of adobe (cylindrical); length, 5 inches; diameter, 4¼ inches	1
252056	56	Piece of adobe, irregular shape	1

[1] These were purchased from an Indian who may or may not have picked them up on the surface at or near the ruin. They illustrate the form of spade introduced by the Spaniards and used by the Pima long after the American occupation.

Accession No. 48761, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252057	57	Piece of adobe, incised design	1
252058	58	Part of large disk of clay, bearing stamped design	1
252059	59	Globular and irregularly shaped concretions; shrine offerings	95
252060	60	Squared pieces of lava, mealing stones	4
252061	61	Squared pieces of lava, with pits on two surfaces; 5½ x 4 x 2½ inches	1
252062	62	Pitted stone, oval outline, lava; length, 4½ inches	1
252063	63	Rubbing stone (lava), disk with rounded upper surface; diameter, 4¼ inches	1
252064	64	Fragment of implement (lava), originally with perforation	1
252065	65	Pestle (lava) with expanding base; length, 3½ inches	1
252066	66	Rubbing stone; 5 x 3 x 2 inches	1
252067	67	Hammer stone, cylindrical; length, 2¼ inches; diameter, 1¾ inches	1
252068	68	Hammers, irregularly shaped, with abraded edges	4
252069	69	Fragment of metate	1
252070	70	Fragment of baking plate	1
252071	71	Water-worn pebbles, slight evidences of use; rubbing stones	2
252072	72	Disk-like natural forms	2
252073	73	Chipped blade, digging implement; 5¾ x 4½ x ⅝ inches	1
252074	74	Piece of stone, flat surface, with traces of paint	1
252075	75	Sharpening or abrading implement, made of sandstone, with squared edges; 5¼ x 5 x 1¼ inches	1
252076	76	Sharpening or abrading stone, made of sandstone, with squared edges; 6½ x 3½ x 1½ inches	1
252077	77	Sharpening or abrading stone; 4 x 2 x ⅝ inches	1
252078	78	Sharpening or abrading stone; 3¾ x 2¼ x ½ inches	1
252079	79	Sharpening or abrading stone; 3 x 1⅜ x ⅞ inches	1
252080	80	Sharpening or abrading stone; sandstone, with longitudinal groove in one surface; 5½ x 4¼ x 1½ inches	1
252081	81	Sharpening or abrading stone, tufa; 5½ x 3¾ x 2¼ inches	1
252082	82	Slab for mixing paint; 5½ x 3½ x ⅝ inches	1
252083	83	Whetstone, oval section; 8 x 1¾ x 1⅜ inches	1
252084	84	Lot of charred and much weathered pieces of wood, beams, lintels, etc., from the northwest court, Compound A	1
252085	85	Lot of charred timbers, etc	1
252086	86	Hammer stones; irregularly shaped pieces with battered edges	16
252087	87	Rubbing implement (lava); section, rounded prism; length, 4½ inches	1
252088	88	Rubbing implement; irregular shape, with one flat surface; length, 4½ inches	1
252089	89	Rubbing implement; irregular shape, with one flat surface; length, 4 inches	1
252090	90	Small pestle (lava); conical; length, 4 inches	1
252091	91	Rubbing implements of tufa; nearly disk-shaped; diameters, 2½ to 2¾ inches	3
252092	92	Sharpening or abrading implement, sandstone, with squared edges; 6¾ x 4¼ x 1⅜ inches	1
252093	93	Sharpening or abrading implement (fragment)	1
252094	94	.....do	1
252095	95	Sharpening or abrading implement (fragment; sandstone)	1
252096	96	Stone with much worn depressions, grinding stone for implements; 6¾ x 6 x 1 inches	1
252097	97	Small paint mortar, oval outline; 4 x 2⅜ x 1½ inches	1
252098	98	Grooved stone, shaft rubber; irregular outline	1
252099	99	Water-worn pebbles; no signs of use	4
252100	100	Fragment of obsidian	1
252101	101	Piece of ore	1
252102	102	Mass of quartz crystals	1
252103	103	Concretions of unusual forms	4
252104	104	Piece of baked clay	1

Accession No. 48761, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252105	105	Fragments of charred textile, garment, room west of Father Font's room, Compound A	1
252106	106	.....do	1
252107	107	Charred basketry	1
252108	108	Charred corn and fragments of basketry	1
252109	109	Mass of charred thread	1
252110	110	Charred corn	1
252111	111	Piece of charred reeds wrapped with twine	1
252112	112	Charred seeds	1
252113	113	Charred basketry	1
252114	114	Shell, Pectunculus	1
252115	115	Shell, Cardita	1
252116	116	Unworked shells, Conus	8
252117	117	Pendant made from Pecten shell	1
252118	118	Pendant (fragment), section of shell	1
252119	119	Shell pendant	1
252120	120	Shell pendant, made from Conus shells	2
252121	121	Shell bead	1
252122	122	Fragments of decorated pottery	3
252123	123	Pottery ladle, toy	1
252124	124	Pottery head, representing animal	1
252125	125	Pottery disk, perforated; diameter, 1½ inches	1
252126	126	Piece of red ocher, from room west of Father Font's room, Compound A	1
252127	127	Fragment of cement	1
252128	128	Quartz crystal	1
252129	129	Piece of obsidian	1
252130	130	Piece of fossil wood	1
252131	131	Concretion	1
252132	132	Flakes of jasper (1) and obsidian (2)	3
252133	133	Small rubbing stone; 2½ x 1⅝ inches	1
252134	134	Implement of wood, hoe; northwest court, Casa Grande; length, 19 inches	1
252135	135	Implement of wood (part of); northwest court, Casa Grande; length, 6½ inches	1
252136	136	Implement of wood; northwest court, Casa Grande; 7¾ x 2 inches	1
252137	137	Implement of wood; northwest court, Casa Grande; 5 x 2 inches	1
252138	138	Implement of wood; northwest court, Casa Grande; 8 x 2¼ inches	1
252139	139	Implement of wood; northwest court, Casa Grande; height, 6 inches; diameter, 3¾ inches	1
252140	140	Shell pendant ornament, Pectunculus; Mound 2, Group B, Casa Grande; diameters, 1¼ and 2¼ inches	2
252141	141	Shell pendant ornament, Turritella; length, 2⅜ inches	1
252142	142	Shell ear pendants; fragments; Pectunculus	3
252143	143	Shell pendants, Conus	3
252144	144	Conus shells, not worked	4
252145	145	Fragment of decorated pottery	1
252146	146	Fragment of pottery vessel; shallow dish; northwest room, Compound A, Casa Grande; diameter, 4 inches	1
252147	147	Piece of float copper, found free in soil, 1906; north room of Casa Grande; 3¼ x 1 inches	1
252148	148	Earthenware bowl, plain ware; height, 4 inches; diameter, 7¾ inches	1
252149	149	Earthenware bowl; interior has painted design; height, 4 inches; diameter, 6¾ inches	1
252150	150	Earthenware bowl, compressed globular, plain ware; height, 4 inches; diameter, 5¾ inches	1

Accession No. 48761, Casa Grande, Arizona– Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252151	151	Earthenware vase, compressed, globular body, short neck; height, 6 inches; diameter, 7 inches	1
252152	152	Pectunculus shells, found in vase No. 252151	15
252153	153	Small earthenware vase, containing small shells (Nassa), Conus shells, bits of turquoise, deer tooth, etc.; diameter, 3½ inches; height, 2½ inches	1
252154	154	Fragments of decorated pottery, various designs	10
252155	155	.....do	11
252156	156	Fragments of decorated pottery, various designs; fragment with swastika design	7
252157	157	Pottery disks, made from broken vessels; diameters, 1⅝ to 3 inches	6
252158	158	Pottery disks, made from perforated vessels; diameters, 1¼ to 2 inches	7
252159	159	Fragments of pottery, representing head of parrot	1
252160	160	Fragments of pottery, representing animal head	1
252161	161	Grooved stone ax; length, 7 inches	1
252162	162	Grooved stone ax; length, 6½ inches	1
252163	163	Polished stone implement, chisel(?); 7 x 1¾ x ½ inches	1
252164	164	Abrading implement, sandstone, squared edges; 6 x 2¾ x 1 inches	1
252165	165	Mealing stone; 5 x 3½ x ¾ inches	1
252166	166	Stone implement; length, 3½ inches	1
252167	167	Abrading implement, grooved surfaces; length, 2½ inches	1
252168	168	Abrading implement, tool sharpener (?); length, 3¼ inches	1
252169	169	Stone implement; 4⅝ x 3¼ x ½ inches	1
252170	170	Stone implement, polisher (?); 4½ x 2½ x ½ inches	1
252171	171	Stone implement; length, 4⅛ inches; diameter, ½ inch	1
252172	172	Rubbing stone, with handle, tufa; diameter, 4¼ inches	1
252173	173	Stone pestle (lava); length, 3¾ inches	1
252174	174	Stone disk; diameter, 5 inches; thickness, ⅝ inch	1
252175	175	Stone disk, partly perforated; diameter, 3½ inches; thickness, ⅜ inch	1
252176	176	Stone disk; perforated; diameter, 2 inches; thickness, ⅛ inch	1
252177	177	Stone implement, oval outline, thin flat pebble; 3½ x 2½ x ⅜ inches	1
252178	178	Stone balls; diameters, 1⅞ to 2½ inches	6
252179	179	Hoe, thin blade, chipped; length, 5¾ inches	1
252180	180	Hoe, one edge showing wear; length, 6½ inches	1
252181	181	Hoe, one edge showing wear; length, 4¾ inches	1
252182	182	Hoe, one edge showing wear; length, 5¾ inches	1
252183	183	Concretion resembling grooved implement; length, 3 inches	1
252184	184	Obsidian chips	9
252185	185	Worked flake of obsidian; length, 2¾ inches	1
252186	186	Arrow-point, flint, triangular; length, 2⅛ inches	1
252187	187	Arrow-points, flint, stemmed; lengths, 2⅛ and 1¾ inches	2
252188	188	Perforator or drill, chalcedony; length, 1⅜ inches; diameter, ⅛ inch	1
252189	189	Fragments of turquoise	22
252190	190	Turquoise beads	2
252191	191	Piece of carved red jasper (amulet)	1
252192	192	Small water-worn pebbles of rare forms	8
252193	193	Concretions, stone chips	7
252194	194	Quartz crystals	5
252195	195	Large shells (Cardium), unworked	3
252196	196	Small shells, Pectunculus, unworked	4
252197	197	Shells, Conus, unworked	10
252198	198	Shells, Olivella, some worked	9
252199	199	Shell pendants, Turritella	3
252200	200	Fragments of shell ear pendants made from sections of Pectunculus	8
252201	201	Shell pendants, Pecten	2

Accession No. 48761, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252202	202	Shell beads, made from entire shells, Nassa	12
252203	203	Shell pendants, small Glycymeris	2
252204	204	Bone perforator; length, 4½ inches	1
252205	205	Bone perforator, part of deer antler; length, 2¼ inches	1
252206	206	Tooth of deer	1
252207	207	Mass of vegetable substance	1
252208	208	Piece of vegetable substance	1
252209	209	Fragment of fabric made from vegetable fiber	1
252210	210	Mealing stone for metate; 7¼ x 3¼ inches	1
252211	211	Mealing stone for metate; 7½ x 3½ inches	1
252212	212	Mealing stone for metate; 8 x 3¾ inches	1
252213	213	Mealing stone for metate; 7 x 3¼ inches	1
252214	214	Mealing stone for metate; 7 x 3⅛ inches	1
252215	215	Mealing stone for metate; 7¼ x 3¼ inches	1
252216	216	Mealing stone for metate; 6 x 3⅜ inches	1
252217	217	Mealing stone for metate; 5¾ x 3½ inches	1
252218	218	Mealing stone for metate; 6 x 3¾ inches	1
252219	219	Mealing stone for metate; 6¾ x 3⅜ inches	1
252220	220	Mealing stone for metate; 7½ x 3½ inches	1
252221	221	Mealing stone for metate; 7¾ x 4 inches	1
252222	222	Mealing stone for metate; 5¾ x 3 inches	1
252223	223	Mealing stone for metate; 5½ x 3¼ inches	1
252224	224	Mealing stone for metate; 6 x 3⅜ inches	1
252225	225	Mealing stone for metate; 6½ x 3¾ inches	1
252226	226	Mealing stone for metate; 5¾ x 3¾ inches	1
252227	227	Mealing stone for metate; 5¾ x 3½ inches	1
252228	228	Mealing stone for metate; 5¼ x 3¾ inches	1
252229	229	Mealing stone for metate; 8 x 4 inches	1
252230	230	Mealing stone for metate; 5 x 2¾ inches	1
252231	231	Broken mealing stones	6
252232	232	Shallow paint mortar; 6½ x 2¾ inches	1
252233	233	Stone mortar; diameter, 9¾ inches; height, 4¾ inches	1
252234	234	Stone pestle (part of); height, 4¾ inches	1
252235	235	Rubbing stone; 5 x 4 inches	1
252236	236	Rubbing stone; 5 x 3½ inches	1
252237	237	Rubbing stone; 4½ x 2¾ inches	1
252238	238	Rubbing stone; 4 x 3⅜ inches	1
252239	239	Rubbing stone; 4½ x 3¼ inches	1
252240	240	Rubbing stone; 4¾ x 2¾ inches	1
252241	241	Hammer stones	6
252242	242	Mealing stone (broken)	1
252243	243	Stone disk; diameter, 3½ inches	1
252244	244	Rubbing stone, natural form; 6½ x 4½ x 1¼ inches	1
252245	245	Rubbing stone; 8½ x 2⅜ inches	1
252246	246	Stone implement, pestle, expanding base; height, 2½ inches	1
252247	247	Natural form resembling handled implement	1
252248	248	Natural form resembling handled implement; 6½ x 7½ inches	1
252249	249	Flint cores or nuclei	3
252250	250	Chips of obsidian	5
252251	251	Bits of turquoise	7
252252	252	Small stone, polished; length, 2¼ inches	1
252253	253	Quartz crystals	3
252254	254	Rounded pebbles, small	2

Accession No. 48761, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252255	255	Small pieces of mica	2
252256	256	Shell, slightly worked, Pectunculus	1
252257	257	Conus shells, unworked	6
252258	258	Shell pendants, Conus	6
252259	259	Shell disk, drilled on edge for suspension; diameter, 1⅜ inches	1
252260	260	Fragments of shell pendants	6
252261	261	Shell pendant; length, 1⅛ inches	1
252262	262	Shell pendants; small shells (Pecten)	2
252263	263	Fragments of various shells	6
252264	264	Spurs of fowl	2
252265	265	Bone awl; length, 4⅜ inches	1
252266	266	Bone needle; length, 2⅜ inches	1
252267	267	Fragments of painted pottery, handle of vase	1
252268	268	Pottery disk made from broken vase; diameter, 2 inches	1
252269	269	Small baked clay vessel; diameter, 1¾ inches	1
252270	270	Leg of tripod dish	1
252271	271	Fragments of pottery showing various decorations	15
252272	272	Long wooden hoe; length, 36 inches	1
252273	273	Long wooden hoe; length, 34 inches	1
252274	274	Long wooden hoe; length, 31 inches	1
252275	275	Long wooden hoe; length, 36½ inches	1
252276	276	Wooden posts of beams, showing marks of stone-cutting tools	12
252277	277	Mealing stone for metate; 8¾ by 3¾ inches	1
252278	278	Mealing stone for metate; 8 x 3½ inches	1
252279	279	Mealing stone for metate; 8⅜ x 3½ inches	1
252280	280	Mealing stone for metate; 8 x 3½ inches	1
252281	281	Mealing stone for metate; 7½ x 3⅜ inches	1
252282	282	Mealing stone for metate; 6¾ x 3½ inches	1
252283	283	Mealing stone for metate; 6½ x 4¼ inches	1
252284	284	Mealing stone for metate; 5 x 3½ inches	1
252285	285	Mealing stone for metate; 6½ x 3¾ inches	1
252286	286	Mealing stone for metate; 6½ x 3 inches	1
252287	287	Mealing stone for metate; 7¼ x 3 inches	1
252288	288	Mealing stone for metate; 7½ x 4¼ inches	1
252289	289	Mealing stone for metate; 7 x 3¾ inches	1
252290	290	Mealing stone for metate; 6¾ x 3½ inches	1
252291	291	Mealing stone for metate; 5½ x 3¼ inches	1
252292	292	Mealing stone for metate; 5½ x 3¼ inches	1
252293	293	Mealing stone for metate; 5¾ x 2¾ inches	1
252294	294	Small mortar; 5½ x 3¾ inches	1
252295	295	Mortar; diameter, 11½ inches; height, 7½ inches	1
252296	296	Mealing stone; 9¼ x 4 inches	1
252297	297	Mealing stone; 8 x 3¾ inches	1
252298	298	Mealing stone; 7½ x 3¾ inches	1
252299	299	Mealing stone; 8¼ x 3¼ inches	1
252300	300	Mealing stone; 7½ x 3⅜ inches	1
252301	301	Mealing stone; 7¼ x 3½ inches	1
252302	302	Mealing stone; 6¾ x 3½ inches	1
252303	303	Mealing stone; 5½ x 3½ inches	1
252304	304	Mealing stone; 5⅜ x 3¼ inches	1
252305	305	Mealing stone, recently worked edges; 9¾ x 2¾ inches	1
252306	306	Natural form; 6 x 1¾ x ¾ inches	1
252307	307	Grooved stone ax, large ruin near Florence, Arizona; length, 6½ inches	1

Accession No. 48761, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252308	308	Grooved stone ax, large ruin near Florence, Arizona; length, 6¾ inches	1
252309	309	Grooved stone ax, large ruin near Florence, Arizona; length, 6½ inches	1
252310	310	Grooved stone ax, large ruin near Florence, Arizona; length, 6½ inches	1
252311	311	Grooved stone ax, large ruin near Florence, Arizona; length, 4¾ inches	1
252312	312	Grooved stone ax, large ruin near Florence, Arizona; length, 4 inches	1
252313	313	Grooved stone ax, found by Mr. Schultz near an abandoned corral at Casa Grande; length, 7¾ inches	1
252314	314	Grooved stone ax; room northeast cluster, Compound A, Casa Grande; length, 5⅝ inches	1
252315	315	Grooved stone ax; length, 8 inches	1
252316	316	Grooved stone ax; length, 8½ inches	1
252317	317	Grooved stone ax; length, 5⅞ inches	1
252318	318	Grooved stone ax; length, 5½ inches	1
252319	319	Grooved stone ax; length, 5 inches	1
252320	320	Grooved stone ax, length, 4¾ inches	1
252321	321	Grooved stone ax; length, 4⅛ inches	1
252322	322	Grooved stone ax; length, 4 inches	1
252323	323	Grooved stone ax (squared sides); length, 4½ inches	1
252324	324	Grooved stone ax, double-bitted; length, 5¼ inches	1
252325	325	Grooved stone ax, red jasper; length, 5 inches	1
252326	326	Grooved hammer; broken ax, showing use as hammer; length, 5⅝ inches	1
252327	327	Grooved hammer; broken ax, showing use as hammer; length, 5½ inches	1
252328	328	Grooved hammer; broken ax, showing use as hammer; length, 5¼ inches	1
252329	329	Grooved hammer; broken ax, showing use as hammer; length, 5 inches	1
252330	330	Grooved hammer; broken ax, showing use as hammer; length, 4½ inches	1
252331	331	Grooved hammer; broken ax, showing use as hammer; length, 5 inches	1
252332	332	Grooved hammer; broken ax, showing use as hammer; length, 4¾ inches	1
252333	333	Grooved hammer; broken ax, showing use as hammer; length, 4 inches	1
252334	334	Grooved hammer; broken ax, showing use as hammer; length, 4½ inches	1
252335	335	Grooved ax; length, 7¾ inches	1
252336	336	Hammer stone; diameter, 3¾ inches	1
252337	337	Hammer stone; diameter, 1½ inches	1
252338	338	Rubbing stone (lava); 3⅝ x 2¾ inches	1
252339	339	Rubbing stone, natural form utilized; length, 3½ inches	1
252340	340	Thin slab, sharpening stone; 4¼ x 2¼ x ¼ inches	1
252341	341	Stone disk (natural form); diameter, 2 inches	1
252342	342	Arrow-shaft rubber (2 grooves); length, 2½ inches	1
252343	343	Arrow-shaft rubber (fragment)	1
252344	344	Fragment of drilled ceremonial stone; 2¾ inches	1
252345	345	Piece of tufa	1
252346	346	Piece of quartz (pale green)	1
252347	347	Quartz crystals	7
252348	348	Concretions, various shapes; shrine offerings	17
252349	349	Obsidian cores and flakes	7
252350	350	Chips of flint and jasper	6
252351	351	Bits of turquoise	15
252352	352	Paint stone	1
252353	353	Piece of yellow ocher	1
252354	354	Arrow point, flint; stemmed; length, 2 inches	1
252355	355	Fragments of large marine shells	16
252356	356	Cardium shells	6
252357	357	Pectunculus shells, slightly worked	6
252358	358	Conus shells	29

Accession No. 48761, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252359	359	Venus shell; used as paint cup	1
252360	360	Shell pendant, Pectunculus, drilled for suspension	1
252361	361	Fragment of ear pendants, sections of Pectunculus	8
252362	362	Shell pendants, made from Conus shells	49
252363	363	Shell pendant, Pecten	1
252364	364	Shells, Olivella, some worked	12
252365	365	Shell beads, made from Nassa shells	28
252366	366	Shell pendant, Turritella	1
252367	367	Shell pendant, Cerithium	1
252368	368	Small shell, Glycymeris	1
252369	369	Shell ring, made from Conus	1
252370	370	Fragments of charred shells	1
252371	371	Bone perforator, mound east of Group B, Casa Grande, found on breast of skeleton, point resting on right shoulder; length, 10 inches	1
252372	372	Bone perforators; 2 to 4½ inches	7
252373	373	Fragments of bone, implements	10
252374	374	Fragments of charred bone	3
252375	375	Bone point, charred, antler tip; length, 3 inches	1
252376	376	Small cylinder of wood, showing tool marks, much weathered; length, 2¾ inches; diameter, ⅝ inch	1
252377	377	Fragments of wooden implements	2
252378	378	Branch or stem; length, 5½ inches	1
252379	379	Mass of charred beans; mesquite	1
252380	380	Charred reeds	1
252381	381	Pottery disks; height, 3 inches; diameter, 4¾ inches	1
252382	382	Pottery bowls, plain ware; diameters, 1⅞ to 3 inches	3
252383	383	Fragments of small tripod dish	1
252384	384	Legs of tripod dish	2
252385	385	Fragments of decorative pottery, swastika scroll and other designs	4
252386	386	Fragments of coarse heavy earthenware dish	2
252387	387	Fragments of decorated pottery vases, large lot	1
252388	388	Hammer stones	4
252389	389	Mealing stones (fragments)	3
252390	390	Fragments of sharpening stones	2
252391	391	Digging implements, large thin flakes with more or less chipped edges	5
252392	392	One-half of stone ball (lava); diameter, 3½ inches	1
252393	393	Large mass of baked clay	1
252394	394	Implements of baked clay, pestlelike; length, 8½ inches; diameter, 2¾ inches	1
252395	395	Fragments of large baked clay disk showing stamped markings	4
252396	396	Lump of adobe with markings of reeds on one surface	1
252397	397	Lump of adobe with markings	1
252398	398	Fragment of pottery	1
252399	399	Perforated stone, with squared sides, worn out mortar; 13½ x 11½ x 6 inches	1
252400	400	Large stone metate; 18¼ x 12½ x 7 inches	1
252401	401	Hammer stones	3
252402	402	Half of sandstone disk; diameter, 4½ inches	1
252403	403	Thin slab with one smoothed surface; 4¼ x 3 x ¼ inches	1
252404	404	Fragment of stone hoe	1
252405	405	Fragment of thin stone disk	1
252406	406	Smoothing implement; 2¾ x ⅞ x $\frac{5}{16}$ inches	1
252407	407	Leaf-shaped arrow-point	1
252408	408	Arrow-point, stemmed	1
252409	409	Chips and flakes of flint, etc	19

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U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252410	410	Chips and flakes of obsidian	6
252411	411	Small water-worn pebbles	3
252412	412	Piece of chalky substance (paint)	1
252413	413	Quartz crystal	1
252414	414	Bit of turquoise	1
252415	415	Concretions	2
252416	416	Fragments of animal bones, 2 pieces worked	1
252417	417	Fragments of charred bones	4
252418	418	Bone points, charred	4
252419	419	Fragments of animal tooth (deer)	1
252420	420	Fragments of shells, Venus; valves more or less broken	9
252421	421	Fragments of shells, Cardium; valves more or less broken	1
252422	422	Fragments of massive marine shell	1
252423	423	Fragments of shell, Abalone	1
252424	424	Fragments of shell, Strombus	1
252425	425	Fragments of charred shell	1
252426	426	Shells, Conus	4
252427	427	Shells, Olivella	3
252428	428	Shells, Pecten, 1 valve	1
252429	429	.....do	1
252430	430	Shell pendant, drilled valve of Pecten	1
252431	431	Fragments of pendants, section of Pectunculus	5
252432	432	Charred seeds	1
252433	433	Charred vegetable substance	1
252434	434	Charred corn	1
252435	435	Charred seeds	1
252436	436	Jar containing earth and Nassa shells	1
252437	437	Shaft or handle for stone implements; length, 17 inches	1
252438	438	Pottery disks, made from broken vases; diameters, 1¼ to 3¼ inches	18
252439	439	Pottery disks, perforated (broken)	2
252440	440	Fragments of large pottery disk, stamp markings	3
252441	441	Fragments of pottery dish, shallow	1
252442	442	Part of pottery vase, angular outline, plain ware	1
252443	443	.....do	1
252444	444	Part of pottery vase, compressed globular	1
252445	445	Part of bowl	1
252446	446	Part of vase, straight sides	1
252447	447	Fragments of pottery bowl, polished black ware	6
252448	448	Fragments of pottery vase, decoration in red and green	6
252449	449	Handles of vases	5
252450	450	Legs of tripod vases	3
252451	451	Fragment of pottery bowl, hole near edge	1
252452	452	Fragment of painted vase, showing coils on exterior	1
252453	453	Fragment of pottery, white or pale yellow slip wash, hundreds of pieces, decorations in black, large lot	1
252454	454	Fragments of pottery, gray slip wash, black decorations	1
252455	455	Fragments of pottery, pale yellow slip wash, decorations in black, with solid areas of red	1
252456	456	Fragments of pottery, pale yellow slip wash, decorations in red	1
252457	457	Fragments of pottery, plain undecorated ware, large lot	1
252458	458	Polishing stone; length, 2½ inches; width, 1½ inches	1
252459	459	Rubbing stone (sandstone); 3 x 2½ x ⅞ inches	1
252460	460	Rubbing stone (sandstone), part of	1

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U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
252461	461	Rubbing stone (sandstone), oval outline; length, 2¾ inches	1
252462	462	Digging tool, large flake, oval outline; length, 5½ inches	1
252463	463	Digging tool, large thin flake, irregular outline; length, 6½ inches	1
252464	464	....do	1
252465	465	Digging tool, large thin flake, irregular outline; length, 5 inches	1
252466	466	Fragments of large marine shell, charred	1
252467	467	Fragment of large marine shell	1
252468	468	Fragments of shells, some showing use as paint cups	1
252469	469	Fragment of pendant, section of Pectunculus	1
252470	470	Mass of charred corn	1
252471	471	Charred seeds	1
252472	472	Piece of adobe showing impression of reeds	1
252473	473	Implement of wood (part of); length, 6½ inches	1
252474	474	Painted pottery bowl, with bits of shell, modern ware; diameter, 4⅜ inches	1
252475	475	Painted pottery vase, with glass beads, modern ware; length, 2¼ inches	1
252476	476	Gambling sticks, modern	4

Accession No. 49619, Casa Grande, Arizona

254301	1	Large unfinished stone ax, natural form, showing shaping process of grooving and surfacing by pecking; 12 x 3½ x 4 inches	1
254302	2	Grooved stone ax, interrupted groove; 8 x 3 x 2¼ inches	1
254303	3	Grooved stone ax, interrupted groove; 7¾ x 2½ x 1½ inches	1
254304	4	Grooved stone ax, interrupted groove; 7 x 2¾ x 1⅞ inches	1
254305	5	Grooved stone ax, interrupted groove; 7 x 2¼ x 1¾ inches	1
254306	6	Grooved stone ax, interrupted groove; 6¾ x 2¾ x 2¼ inches	1
254307	7	Grooved stone ax, interrupted groove; 6½ x 2¾ x 2 inches	1
254308	8	Grooved stone ax, interrupted groove; 5½ x 3 x 2¼ inches	1
254309	9	Grooved stone ax, interrupted groove; 5½ x 2¾ x 1½ inches	1
254310	10	Grooved stone ax, interrupted groove; 6 x 2½ x 2¼ inches	1
254311	11	Grooved stone ax, interrupted groove; 6 x 2¼ x 2 inches	1
254312	12	Grooved stone ax, interrupted groove; 6 x 2¼ x 2 inches	1
254313	13	Grooved stone ax, interrupted groove; 6¼ x 2½ x 1½ inches	1
254314	14	Grooved stone ax, interrupted groove; 5½ x 2½ x 1¼ inches	1
254315	15	Grooved stone ax, interrupted groove; 6¼ x 2¼ x 1¾ inches	1
254316	16	Grooved stone ax, interrupted groove; 6 x 2¼ x 1¼ inches	1
254317	17	Grooved stone ax, interrupted groove; 5 x 2¼ x 1⅞ inches	1
254318	18	Grooved stone ax, interrupted groove; 4¼ x 1½ x 1¼ inches	1
254319	19	Grooved stone ax, interrupted groove; 3¼ x 2¼ x 1⅞ inches	1
254320	20	Grooved stone ax, double-bitten encircling groove; 5 x 3½ x 1¼ inches	1
254321	21	Broken ax blade, upper portion roughened; 3 x 2 x 1¼ inches	1
254322	22	Grooved stone hammer or sledge; 8 x 3 x 2½ inches	1
254323	23	Grooved stone hammer or sledge; 7 x 3 x 2¼ inches	1
254324	24	Grooved stone hammer; 6¼ x 2 x 1½ inches	1
254325	25	Grooved stone hammer; 5 x 2¼ x 1½ inches	1
254326	26	Grooved stone hammer; 4¼ x 3¾ x 2 inches	1
254327	27	Grooved stone hammer; 4½ x 2½ x 1⅞ inches	1
254328	28	Grooved stone hammer; 4 x 2½ x 2½ inches	1
254329	29	Grooved stone hammer; 3¾ x 2¼ x 1⅞ inches	1
254330	30	Grooved stone hammer; 3¾ x 2 x ⅞ inches	1
254331	31	Grooved stone hammer (broken); 4¼ x 3 x 2½ inches	1
254332	32	Grooved stone hammer (broken); 4⅞ x 2¼ x 1¼ inches	1

Accession No. 49619. Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254333	33	Hammer stone, cylindrical; 4¼ x 2¼ x 2 inches	1
254334	34	Hammer stone, roughly spheroidal; diameter, 3½ inches	1
254335	35	Hammer and rubbing stone; 3¼ x 2½ x 1½ inches	1
254336	36	Hammer stone, square, with rounded edges; diameter, 2 inches	1
254337	37	Rubbing stone; 3¼ x 1¾ x 1 inches	1
254338	38	Paint muller, conical outline; length, 3 inches; diameter, 1¾ inches	1
254339	39	Paint muller, conical outline; length, 3 inches; diameter, 2¼ inches	1
254340	40	Chalcedony concretion; cylindrical outline, surfaces slightly polished by use; length, 3¼ inches; diameter, 1¾ inches	1
254341	41	Rubbing stone for metate, having parallel edges with rounded ends (lava); 8¾ x 3½ x 1½ inches	1
254342	42	Rubbing stone for metate, having parallel edges with rounded ends (basalt); 8 x 3¾ x 1½ inches	1
254343	43	Rubbing stone for metate, having parallel edges with rounded ends (lava); 6¾ x 3¾ x 1¾ inches	1
254344	44	Rubbing stone for metate, having parallel edges with rounded ends (basalt); 7 x 3½ x 1½ inches	1
254345	45	Rubbing stone for metate, having parallel edges with rounded ends (basalt); 7 x 3½ x 1 inches	1
254346	46	Rubbing stone for metate, having parallel edges with rounded ends (basalt); 7¾ x 3¼ x 1 inches	1
254347	47	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 7 x 3½ x 1¼ inches	1
254348	48	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 6¾ x 3 x 1¼ inches	1
254349	49	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 6¼ x 3½ x 1 inches	1
254350	50	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 5¾ x 3½ x 1¼ inches	1
254351	51	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 6½ x 3¼ x 1½ inches	1
254352	52	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 6¼ x 3½ x 1¼ inches	1
254353	53	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 5½ x 3 x 1½ inches	1
254354	54	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 5 x 3¼ x 1¾ inches	1
254355	55	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 5½ x 3¾ x 1⅝ inches	1
254356	56	Rubbing stone for metate, having parallel sides, edge with rounded ends (lava); 6¼ x 3½ x 1½ inches	1
254357	57	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 6 x 3½ x 1¼ inches	1
254358	58	Rubbing stone for metate, having parallel sides, edge with rounded ends (lava); 6¼ x 3½ x 1½ inches	1
254359	59	Rubbing stone for metate, having parallel sides, edge with rounded ends (lava); 4½ x 4 x 1¾ inches	1
254360	60	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 5¾ x 3½ x 1½ inches	1
254361	61	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 6½ x 3½ x 1 inches	1
254362	62	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 8½ x 3½ x 3½ inches	1

Accession No. 49619, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254363	63	Rubbing stone for metate, having parallel sides, edge with rounded ends (lava); 7½ x 3½ x 1½ inches	1
254364	64	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 7½ x 3½ x 1½ inches	1
254365	65	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 8 x 3½ x 1½ inches	1
254366	66	Rubbing stone for metate, having parallel sides, edge with rounded ends (lava); 7 x 3½ x 1¼ inches	1
254367	67	Rubbing stone for metate, having parallel sides, edge with rounded ends (basalt); 6½ x 3½ x 1¼ inches	1
254368	68	Rubbing stone for metate, having parallel sides, edge with rounded ends (lava); 5 x 3 x 2¼ inches	1
254369	69	Rubbing stone for metate, having edge slightly curved (basalt); 5 x 3 x 1 inches	1
254370	70	Rubbing stone for metate (basalt); 3¼ x 2¼ x 1½ inches	1
254371	71	Rubbing stone, irregular outline; 6½ x 5 x 1 inches	1
254372	72	Rubbing stone, natural form, semi-lunar outline; 5¾ x 3 x 1 inches	1
254373	73	Grinding or polishing stone, rectangular outline; 4¾ x 3 x ¾ inches	1
254374	74	Grinding or polishing stone, reddish sandstone; 3¾ x 3¼ x ¾ inches	1
254375	75	Grinding or polishing stone, approximately disklike, lava; 3 x 2½ x 1 inches	1
254376	76	Rubbing hammer stone, natural form, approximately disklike outline; diameter, 4 x 1½ inches	1
254377	77	Mortar, large slab, with one slightly concave surface, evidently used for grinding pigments; 10¼ x 8¼ x 2½ inches	1
254378	78	Grinding stone, rectangular outline (sandstone); 6½ x 4½ x 1¼ inches	1
254379	79	Grinding stone, rectangular outline (sandstone); 4¾ x 4 x 1½ inches	1
254380	80	Grinding stone, rectangular outline (sandstone); 3¾ x 3 x 1½ inches	1
254381	81	Grinding stone, rectangular outline (sandstone); showing narrow grooves, possibly sharpening tool for wood and bone awls; broken piece, 4 x 3½ x 1¼ inches	1
254382	82	Grinding stone (broken), sandstone; 4 x 2¼ x 1¼ inches	1
254383	83	Grinding stone (broken), sandstone; 2¼ x 2 x ½ inches	1
254384	84	Thin, irregularly shaped pieces, showing use for grinding pigments; 7½ x 3 x ½ inches	1 1
254385	85	Thin, irregularly shaped pieces, showing use for grinding pigments; 6 x 4¾ x ½ inches	1
254386	86	Thin, irregularly shaped pieces, showing use for grinding pigments; 6¼ x 4 x ⅜ inches	1
254387	87	Thin, irregularly shaped pieces, showing use for grinding pigments; 5 x 3¼ x ½ inches	1
254388	88	Thin, irregularly shaped pieces, showing use for grinding pigments; 3 x 2 x ¼ inches	1
254389	89	Fragment of polishing stone; 2½ x 2½ x ¾ inches	1
254390	90	Paint mortar, rectangular outline (sandstone); 6¾ x 4¼ x 1 inches	1
254391	91	Irregularly shaped piece of sandstone, with pit in one surface, paint mortars; 5½ x 3¼ x 1¾ inches	1
254392	92	Irregularly shaped piece reddish sandstone, with pit in one surface, paint mortar; 5 x 5 x 1¾ inches	1
254393	93	Irregularly shaped stone with pit in one surface, basalt; 4¼ x 3½ x 2¾ inches	1
254394	94	Sharpening stone (?), thin slab, with depression in one surface; 6¾ x 4¼ x 1½ inches	1
254395	95	Small shallow mortar (?), rectangular outline with rounded ends, paint mortar; 5½ x 2¾ x 1¼ inches	1
254396	96	Sharpening stone, irregularly shaped piece, with depressions on two surfaces; 5 x 3 x ⅞ inches	1
254397	97	Sharpening stone, irregularly shaped piece, with depressions in two surfaces; 5 x 2¼ x 1 inch	7
254398	98	Small natural(?) form, with shallow depression; 2¾ x 2 x ½ inches	1

Accession No. 49619, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254399	99	Stone mortar (lava), oval outline, mortar cavity, 1½ inches deep; 9 x 6 x 3¾ inches	1
254400	100	Broken pitted stone (lava), pits in two surfaces; 3 x 3 x 1¾ inches	1
254401	101	Broken pitted stone (lava), disk outline; diameter, 3½ inches; thickness, 1¾ inches	1
254402	102	Small, broken mortar, with hole in one edge; 1¾ x 2 inches	1
254403	103	Grinding stone, irregularly shaped piece, with slight depression in one surface; 5 x 1¾ x 1¾ inches	1
254404	104	Sharpening stone, thin slab, with long, narrow grooves; 11 x 4½ x ½ inches	1
254405	105	Sharpening stone, thin slab, with long, narrow grooves; 3½ x 2 x ¼ inches	1
254406	106	Large stone slab, with depression in one surface made by grinding; the center has been broken out, forming an oval aperture 5½ x 3¾ inches	1
254407	107	Natural form, conical outline, grinding stone; base diameter, 3½ inches; height, 1¾ inches	1
254408	108	Natural form, conical outline, grinding stone; base diameter, 2¾ inches; height, 1¼ inches	1
254409	109	Stone disk, one surface showing depressions as if for grinding or polishing; diameter, 2¾ inches; thickness, 1 inch	1
254410	110	Rubbing stone, outline nearly square (tufa); 4½ x 4 x 1¼ inches	1
254411	111	Rubbing stone, disk-shaped (part of), tufa; diameter, 4¼ inches; thickness, 1¼ inches	1
254412	112	Rubbing stone, oval outline; 5½ x 3¾ x 1¼ inches	1
254413	113	Rubbing stone, disk-shaped; diameter, 4¼ inches; thickness, ⅝ inch	1
254414	114	Rubbing stone, broken, oval; length, 3½ inches; thickness, ¾ inch	1
254415	115	Rubbing stone, oval outline; 3¼ x 2½ x 2 inches	1
254416	116	Rubbing stone, cylindrical (tufa); length, 2½ inches; diameter, 1¼ inches	1
254417	117	Fragment of stone ring, implement (lava)	1
254418	118	Rubbing stone, oval outline (tufa); 5 x 4 x 1½ inches	1
254419	119	Rubbing stone, disk-shaped, with knob handle; diameter, 4 inches; height, 2 inches	1
254420	120	Rubbing stone, disk-shaped (lava), incurved edge, convex base; diameter, 3½ inches; height, 1¾ inches	1
254421	121	Rubbing stone, roughly shaped piece of tufa, with slight groove; length, 3½ inches	1
254422	122	Roughly shaped carving, with animal head (?); height, 2½ inches	1
254423	123	Toy bowl; diameter, 1¼ inches; height, ⅞ inch	1
254424	124	Digging implement, large, thin flake of stone, with one edge showing a polish from use; length, 9½ inches; width, 5½ inches; ½ inch thick at the back	1
254425	125	Digging implement, large, thin flake of stone, with one edge showing a polish from use; length, 8½ inches; width 3 inches; ½ inch thick at the back	1
254426	126	Digging implement, large, thin flake of stone, with one edge showing a polish from use (broken); 6 inches wide; 4 x ½ inch thick at the back	1
254427	127	Digging implement, large, thin flake of stone, with one edge showing a polish from use; 6½ inches wide; 4 x ½ inch thick at the back	1
254428	128	Digging implement, large, thin flake of stone, with one edge showing a polish from use, on three sides; 6½ inches wide; 4 x ⅜ inch at the back	1
254429	129	Digging implement, large, thin flake of stone with one edge showing a polish from use; hoe, notched at upper end; length, 5½ inches; width, 4½ inches; thickness, ¾ inch	1
254430	130	Digging implement, large, thin flake of stone, with one edge showing a polish from use; hoe, notched at upper end; length, 6¼ inches; width, 3½ inches; thickness, ½ inch	1
254431	131	Digging stone implement, large, thin flake of stone with one edge showing a polish from use, or knife, semilunar shape; 6 inches; width, 3½ x ¼ inch	1
254432	132	Digging implement, hoe (see 124, above); length, 4 inches; width, 3¾ inches; thickness at back, ¾ inch	1

Accession No. 49619, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254433	133	Digging implement (broken); 4½ x 3 x ⅜	1
254434	134	Digging implement, hoe (broken), notched; 3½ x 3 x ¼ inches	1
254435	135	Long stone rubbing implement, with two edges, showing transverse grooves (12), section square with rounded edges; length, 11½ inches; thickness, 1¼ inches	1
254436	136	Stone pestle, cylindrical; length, 10 inches; diameter, 2¼ inches	1
254437	137	Stone pestle, roughly shaped; length, 12½ inches; width, 3 x 1½ inches	1
254438	138	Stone pestle, roughly shaped; length, 15 inches; width, 2¼ x 1½ inches	1
254439	139	Natural form implement; length, 8¼ inches; width, 1½ x ¾ inch	1
254440	140	Natural form whetstone; length, 5¼ inches; width, 1¼ x ⅝ inch	1
254441	141	Natural form charm stone; 5½ x 1¼ x 1 inches	1
254442	142	Natural form charm stone, prism section; 4½ x 1 x 1 inches	1
254443	143	Natural form charm stone; length, 4½ inches	1
254444	144	Natural form charm stone; length, 4½ inches	1
254445	145	Natural form charm stone; length, 3¾ inches; width, 1⅛ inches	1
254446	146	Natural form charm stone; 3¾ x 2 x ¾ inches	1
254447	147	Natural form charm stone; 3½ x ¾ inches	1
254448	148	Natural form charm stone; 3¾ x ½ inches	1
254449	149	Natural form charm stone; 3 x ¾ inches	1
254450	150	Stone with longitudinal groove; artificial groove, ½ inch deep; 4¼ x 1¼ inches	1
254451	151	Cone-shaped piece of tufa, for drilling in shell; length, 2½ inches; diameter, ⅞ inch	1
254452	152	Water-worn pebble, flat; 4 x 3 x ¾ inches	1
254453	153	Stone disk, thin; diameter, 3⅛ inches; thickness, ¼ inch	1
254454	154	Stone disk, thick; diameter, 2½ inches; thickness, ¾ inch	1
254455	155	Thin pebble, oval outline; length, 2¼ inches; width, 1⅜ inches; thickness, ⅛ inch	1
254456	156	Stone carving, bird-shaped; length, 3½ inches; height, 3¼ inches; width, 3⅜ inches	1
254457	157	Stone carving, conventionalized female figure; length, 8¾ inches; width, 2⅜ inches; thickness, 1¾ inches	1
254458	158	Stone carving, lizard (?); mortar cavity on back for grinding pigments; length, 7¼ inches; width, 4¼ inches; thickness, 1 inch	1
254459	159	Stone carving, part of thin piece with three triangular indentations on one edge; 4¼ x 4 x ⅜ inches	1
254460	160	Ax-shaped stone, with shallow groove; ends and edges with ground faces at different angles; flat surfaces marked with incised lines; charm stone; length, 3¼ inches; width, 2⅞ inches; thickness, ¾ inch	1
254461	161	Stone balls used in games; diameters, 1 inch to 2½ inches	7
254462	162	Concretions more or less spheroidal; charm stones	4
254463	163	Stone balls used in games; diameters, 1 inch to 2½ inches	10
254464	164	Stone concretions, charm stones	4
254465	165	Natural pebbles (small)	10
254466	166	Natural forms fragments of concretions, etc., charm stones	10
254467	167	Fragments of mineral	1
254468	168	Fragments of mineral; turquoise	12
254469	169	Obsidian cove and flakes	5
254470	170	Piece of ore, used as paint	3
254471	171	Piece of ore, used as paint	1
254472	172	Piece of ore, used as paint	10
254473	173	Small water-worn obsidian pebbles	6
254474	174	Piece of specular iron, used for paint	1
254475	175	Piece of red jasper	1
254476	176	Bits of red ocher	4
254477	177	Stone flake	1
254478	178	Flint flakes	
254479	179	Quartz crystals; charm stones	2

Accession No. 49619, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254480	180	Stone disks, spindle whorls, not perforated; diameter, 2½ inches; thickness, 1/16 inch	4
254481	181	Stone disks, spindle whorls, perforated; diameter, 2¼ x 1/16 inch	1
254482	182	Stone disks, spindle whorls, perforated; diameter, 1¾ x 1/16 inch	1
254483	183	Stone disks, spindle whorls, perforated; diameter, 1½ x 1/16 inch	1
254484	184	Carved stone tablet (fragment), rectangular outline; upper surface with raised border, ornamented with incised line design; magic tablet; length, 2 inches; thickness, ¼ inch	1
254485	185	Carved stone tablet (fragment), rectangular outline; upper surface with raised border, ornamented with incised line design; magic tablet; length, 2 inches; thickness, ¼ inch	1
254486	186	Arrow-point, triangular, flint; length, 2½ inches	1
254487	187	Arrow-points, stemmed, flint; lengths, ¾ inch to 1¼ inches	4
254488	188	Arrow-points, triangular, obsidian; length, ¾ inch	2
254489	189	Beads, stone 48, turquoise 72, and pendants (5), mainly turquoise	125
254490	190	Stone pendant, cylindrical body with loop at one end; length, 1¼ inches; diameter, ¾ inch	1
254491	191	Small cylindrical stone tapering at each end; length, 2 inches; diameter, ¼ inch	1
254492	192	Stone head, cylindrical; length, ⅝ inch; diameter, ⅜ inch	1
254493	193	Stone pendant, claw-shaped; length, 1 inch	1
254494	194	Small green stone disk; diameter, ½ inch; thickness, ¼ inch	1
254495	195	Copper bells	2
254496	196	Perforated object of lava, irregular outline, use unknown; 9 x 7 x 3 inches	1
254497	197	Perforated object of lava, small; 4 x 3½ x 1¾ inches	1
254498	198	Fragment of perforated object of lava; 3¾ x 2¼ x 1¾ inches	1
254499	199	Fragments of asbestos	2
254500	200	Natural form, slightly resembling worked stone object; charm-stone; 4 x 3 x 2½ inches	1
254501	201	Natural form, slightly resembling worked stone object; charm-stone; 5 x 3¼ x 2¼ inches	1
254502	202	Natural form, slightly resembling worked stone object; charm-stone; 3¾ x 4 x 2½ inches	1
254503	203	Natural form, slightly resembling worked stone object; charm-stone; 3½ x 3¼ x 1½ inches	1
254504	204	Natural form, slightly resembling worked stone object; charm-stone; 3¾ x 3½ x 2 inches	1
254505	205	Natural form, slightly resembling worked stone object; charm-stone; 3 x 3 x 1¼ inches	1
254506	206	Concretion (geode); 5 x 3 x 3½ inches	1
254507	207	Piece of adobe with perforation; 2 x 2¼ inches	1
254508	208	Roughly worked stone implement; 4½ x 3 x 2¼ inches	1
254509	209	Roughly worked stone hammer; 4 x 2¾ x 2 inches	1
254510	210	Roughly worked stone implement	1
254511	211	Flint flake; 3 x 2¼ x ¾ inches	1
254512	212	Piece of petrified wood; 2¼ x 1⅝ x 1 inches	1
254513	213	Water-worn pebble	1
254514	214	Piece of galena	1
254515	215	Shell, Strombus; length, 7½ inches	1
254516	216	Shell; length, 8 inches	1
254517	217	Shell; length, 7 inches	1
254518	218	Shell; length, 6¼ inches	1
254519	219	Shell; length, 6 inches	1
254520	220	Shell, Murex; length, 5½ inches	1
254521	221	Shell, Haliotis; length, 7½ inches	1

Accession No. 49619, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254522	222	Shell; length, 5½ inches	1
254523	223	Shell; length, 5¼ inches	1
254524	224	Shell; length, 5⅛ inches	1
254525	225	Shell; length, 5 inches	1
254526	226	Shell (broken); length, 4⅝ inches	1
254527	227	Shell (broken); length, 3½ inches	1
254528	228	Shell (broken); length, 3⅛ inches	1
254529	229	Shell (broken); length, 1¾ inches	1
254530	230	Shell; length, 4¾ inches	1
254531	231	Shell; length, 4½ inches	1
254532	232	Shell (broken); length, 3½ inches	1
254533	233	Shell, Pectunculus; diameter, 3½ inches	1
254534	234	Shell, Pectunculus, slightly worked; diameter, 3½ inches	1
254535	235	Shell, Pectunculus, slightly worked; diameter, 2⅝ inches	1
254536	236	Shell, Pectunculus, slightly worked; diameter, 2 inches	1
254537	237	Shell, Pectunculus, slightly worked; diameter, 2 inches	1
254538	238	Shell, Pectunculus, slightly worked; diameter, 1⅞ inches	1
254539	239	Shell, Pectunculus, perforated; diameter, 2¼ inches	1
254540	240	Shell, Pectunculus, perforated; diameter, 2¼ inches	1
254541	241	Shell, Pectunculus, perforated; diameter, 2 inches	1
254542	242	Shell, Pectunculus, fragment, worked	1
254543	243	Shell, Pectunculus, showing frog partly finished; diameter, 2¼ inches	1
254544	244	Shell carving, frog, Pectunculus; diameter, 1¼ inches	1
254545	245	Shell carving, pendant earring, Pectunculus; diameter, 2 inches	1
254546	246	Shell carving, pendant earring, Pectunculus; diameter, 1 inch	1
254547	247	Shell carving, pendant earring, Pectunculus; diameter, ¾ inch	1
254548	248	Shell pendant, Pectunculus; length, 1½ inches	1
254549	249	Shell ornament; length, 1 inch	1
254550	250	Small shell, partly worked; length, ½ inch	1
254551	251	Shell ring, incised decoration; diameter, ¾ inch	1
254552	252	Small shells, worked; lengths, ½ to ¾ inch	2
254553	253	Shell beads, Olivella; lengths, ⅝ to ¾ inch	3
254554	254	Shell beads, Dentalium; lengths, ¾ inch to 1 inch	4
254555	255	Shell disk, Haliotis; diameter, 1 inch	1
254556	256	Shell disk; diameter, ¾ inch	1
254557	257	Shell ornaments, ear pendants, Pectunculus shells	1
254558	258	....do	1
254559	259	....do	1
254560	260	....do	1
254561	261	....do	1
254562	262	....do	1
254563	263	....do	1
254564	264	....do	1
254565	265	....do	1
254566	266	....do	1
254567	267	Fragments of shell ornaments, ear pendants, Pectunculus shells; average diameter, 2¼ inches	13
254568	268	Shell ornament; length, 4¼ inches	1
254569	269	Shell ornament; length, 2⅝ inches	1
254570	270	Shell ornament (broken); length, 1⅝ inches	1
254571	271	Shell ornament; length, 1¼ inches	1
254572	272	Shell pendant made from Conus; lengths, ¾ to 1⅞ inches	11

Accession No. 49619, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254573	273	Conus shells, mainly unworked; lengths, ¾ to 2 inches	14
254574	274	Shell pendant; length, 2½ inches	1
254575	275	Shell pendant; length, 2½ inches	1
254576	276	Shell pendant; length, 2 inches	1
254577	277	Shell pendant; length, 2¼ inches	1
254578	278	Shell pendant; length, 1¾ inches	1
254579	279	Fragments of shell	3
254580	280	Animal bone; length, 2½ inches	1
254581	281	2 fragments of jawbones; lengths, 3 and 4¼ inches	2
254582	282	Animal tooth	1
254583	283	Bones of small animal	10
254584	284	Bone awl; length, 5½ inches	1
254585	285	Bone awl; length, 5¼ inches	1
254586	286	Bone awl; length, 5½ inches	1
254587	287	Bone awl; length, 4¼ inches	1
254588	288	Bone awl; length, 4 inches	1
254589	289	Bone awl, 3 pieces	1
254590	290	Bone whistle; length, 2¼ inches	1
254591	291	Part of wooden implement; length, 6¼ inches	1
254592	292	Part of wooden implement; length, 5½ inches	1
254593	293	....do	1
254594	294	Part of wooden implement; length, 7½ inches	1
254595	295	Paddle-shaped wooden implement; length, 8¼ inches	1
254596	296	Basket tray; diameter, 14 inches	1
254597	297	Corncob; length, 3¼ inches	1
254598	298	Strips of fiber for basket work; bundle	1
254599	299	Strips of fiber for weaving; bundle	1
254600	300	Gourd; length, 14½ inches	1
254601	301	Earthenware bottle, rounded bottom, angular sides, wide mouth; height, 7¼ inches; diameter, 6¼ inches	1
254602	302	Earthenware vase (broken), flat bottom, conical outline, looped handle on one side; height, 4¾ inches; diameter, 4¾ inches	1
254603	303	Earthenware vase, globular body, wide mouth, handle looped on one side, painted decorations, triangular designs in red; height, 4 inches; diameter, 4¾ inches	1
254604	304	Earthenware pot (broken), plain ware; height, 3¼ inches; diameter, 4½ inches	1
254605	305	Earthenware jar, angular outline, wide bottom tapering to mouth, plain ware; height, 4½ inches; diameter, 8 inches	1
254606	306	Earthenware pot (broken), globular body, plain ware; height, 3½ inches; diameter, 5 inches	1
254607	307	Earthenware bowl, plain ware; height, 4 inches; diameter, 6¼ inches	1
254608	308	Earthenware bowl, plain ware; height, 4 inches; diameter, 7¼ inches	1
254609	309	Earthenware jar, flat bottom, nearly straight sides, wide mouth, plain ware; height, 6 inches; diameter at base, 5 inches	1
254610	310	Fragments of bottle (restored)	1
254611	311	Earthenware bowl, plain ware; height, 3 inches; diameter, 5½ inches	1
254612	312	Fragments of bottle	1
254613	313	Earthenware ladle, plain ware; length, 8½ inches; diameter, 5¾ inches; depth, 3 inches	1
254614	314	Earthenware ladle, plain ware; 6¾ x 4¼ x 3 inches	1
254615	315	Earthenware ladle, plain ware; 4¼ x 3 x 1½ inches	1
254616	316	Earthenware ladle, plain ware; 3¼ x 2¼ x ¾ inches	1
254617	317	Earthenware ladle, plain ware; 3⅜ x 2 x ¾ inches	1

Accession No. 49619, Casa Grande, Arizona—Continued.

U. S. Nat. Mus. No.	Bur. Amer. Eth. No.	Articles	Lots
254618	318	Earthenware bowl, exterior red painted, interior dark; diameter, 4 inches; height, 2 inches	1
254619	319	Earthenware bowl, plain ware; diameter, 3¾ inches; height, 2¼ inches	1
254620	320	Earthenware dish, tripod; diameter, 4 inches; height, 1¾ inches	1
254621	321	Earthenware dish, tripod; diameter, 3½ inches; height, 2 inches	1
254622	322	Earthenware dish, tripod; fragment, massive; length, 3½ inches; height, 1¾ inches	1
254623	323	Earthenware bowl, conical outline, painted; interior black, exterior buff, with line and triangular decorations in red; diameter, 3½ inches; height, 2 inches	1
254624	324	Earthenware bowl, flat bottom, straight flaring sides; exterior reddish brown, interior black, polished; diameter, 3½ inches; height, 1½ inches	1
254625	325	Earthenware bowl, decoration and outline ditto; diameter, 3¼ inches; height, 1¼ inches	1
254626	326	Earthenware effigy vessel, bird form; length, 3¾ inches; body, 3 inches wide by 2¼ inches high	1
254627	327	Mass of adobe showing imprint of reeds; length, 4 inches; thickness, 2½ inches	1
254628	328	Earthenware stand for holding round-bottom vessels; diameter, 2 inches; height, 1½ inches	1
254629	329	Legs of tripod vases	6
254630	330	Disks of pottery made from broken vessels; diameters, 1½ inches to 3¼ inches	17
254631	331	Disks of pottery, perforated; diameters, 1 to 2¾ inches	17
254632	332	Earthenware spindle whorl, double convex outline; diameter, 1¼ inches	1
254633	333	... do	1
254634	334	Earthenware spindle whorl, diameter, 1⅝ inches	1
254635	335	....do	1
254636	336	Earthenware pipe, tubular; 2¼ x 1 inches	1
254637	337	Fragment of pottery vessel with bird's head	1
254638	338	Fragment of pottery vessel, looped handle	1
254639	339	.....do	1
254640	340	Fragment of pottery, olla	1
254641	341	Fragment of pottery; decorations in red	10
254642	342	Fragment of pottery; necks and rims of painted vessels, decorated in red	6
254643	343	Fragment of pottery, ladle, gray with black decorations	1
254644	344	Fragment of pottery, large vase, part of rim	1
254645	345	Fragment of pottery, large bowl, interior decoration	1
254646	346	Fragment of pottery, large bowl, interior decoration symbolic	1
254647	347	Fragment of pottery, large bowl, interior decoration	1
254648	348	Fragment of pottery, large olla, exterior decoration	1
254649	349	Fragment of pottery, bowl, interior decoration	1
254650	350	Fragment of pottery, showing luted handle	1
254651	351	.....do	1
254652	352	Fragment of pottery, with hole in one edge	1

ANTIQUITIES OF THE UPPER VERDE RIVER AND WALNUT CREEK VALLEYS, ARIZONA

BY

JESSE WALTER FEWKES

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ANTIQUITIES OF THE UPPER VERDE RIVER AND WALNUT CREEK VALLEYS, ARIZONA

By Jesse Walter Fewkes

INTRODUCTION

The following pages are more in the nature of a preliminary report than an exhaustive account of the antiquities of the valleys of the upper Verde River and Walnut Creek. This report deals with areas little known archeologically, although, by reason of their geographic positions, presenting to the student of the prehistoric culture of Arizona most interesting problems. The aim is to consider types rather than to enumerate many examples of the same kind of ruins. The present discussion is confined for the greater part, though not entirely, to architectural features.

The reader is reminded that the antiquities of these valleys have not been wholly neglected by former students. Ruins believed to be prehistoric were reported from the Verde many years ago, and those on the lower Verde have been described monographically by Mr. Cosmos Mindeleff.[1]

The antiquities of the region bordering the Verde River from Camp Verde to the point where it discharges its waters into the Salt naturally resemble those of the other tributaries of the latter, although the geologic conditions on the upper Verde have led to certain architectural differences. The locality of the ruins here considered is the western frontier of the ancient Pueblo country. The inhabitants of this region, an agricultural people, were subject to attack by powerful nomadic tribes. Here, where defensive structures were necessary, we should naturally look for a relatively large number of forts or fortified hilltops. The upper Verde River and Walnut Creek flow through a part of Arizona occupied to within a few years by the Yavapai, a more or less nomadic tribe of mixed blood, who reasonably may be regarded as descendants of the prehistoric house builders. Descendants of other survivors of prehistoric times may be looked for among several groups of modern Indians of Yuman stock—the Walapai and the Havasupai, especially the latter, now living in the depths of Cataract Canyon, a branch of the Grand Canyon of the Colorado,

[1] In *15th Ann. Rep. Bur. Ethnol.*

where they formerly were driven for protection. According to Major Powell, these people have legends that their ancestors inhabited villages and cliff-houses, and they claim to be descendants of the aboriginal inhabitants of the cinder-cone dwellings near Flagstaff. There is said to be a ruin north of Seligman, Arizona, which they likewise claim as remains of a former home.

The records available constituting the written history of this part of Yavapai County are not very extensive and shed little or no light on its archeology. Western Arizona was visited in 1583 by Antonio de Espejo and was traversed nearly a quarter of a century later by Juan de Oñate, who penetrated as far as the mouth of the Colorado River. Forty years before Espejo the explorer Alarcon at the farthest point reached on his trip up the Colorado heard of stone houses situated in the mountains to the east, and no doubt Father Garcés in 1776 visited some of these villages in his journey from the Colorado to the Hopi villages. The routes of the early Spanish explorers in this region have not yet been very accurately determined; but it is probable that they made use of old Indian trails, one of which ran from the Verde to the Colorado, followed Walnut Creek, and went over Aztec Pass to the sources of the tributaries of the Santa Maria and the Bill Williams River, which flow into the Colorado. Although the accounts of these early travelers are vague, one fact stands out in relief, namely, that the region was populated by Indian tribes, some of whom were agriculturists and sedentary, who constructed stone houses of sufficient size to attract the attention of the explorers. But it was not until early American explorers visited the Southwest that knowledge of this region took more definite form. The Government reports of Sitgreaves in 1853, of Whipple and others in 1853–1854, and of the Wheeler Survey in the '70's drew attention to the ruins, and the establishment by the War Department of a fort on the Verde (moved in 1861 to a near-by site and abandoned in 1891) opened this interesting region to students of archeology connected with the Army. The presence of the camp at Fort Hualapai seems to have led to no scientific results so far as archeology is concerned, although situated in the midst of a valley containing many ruins.[1]

[1] Consult the following:

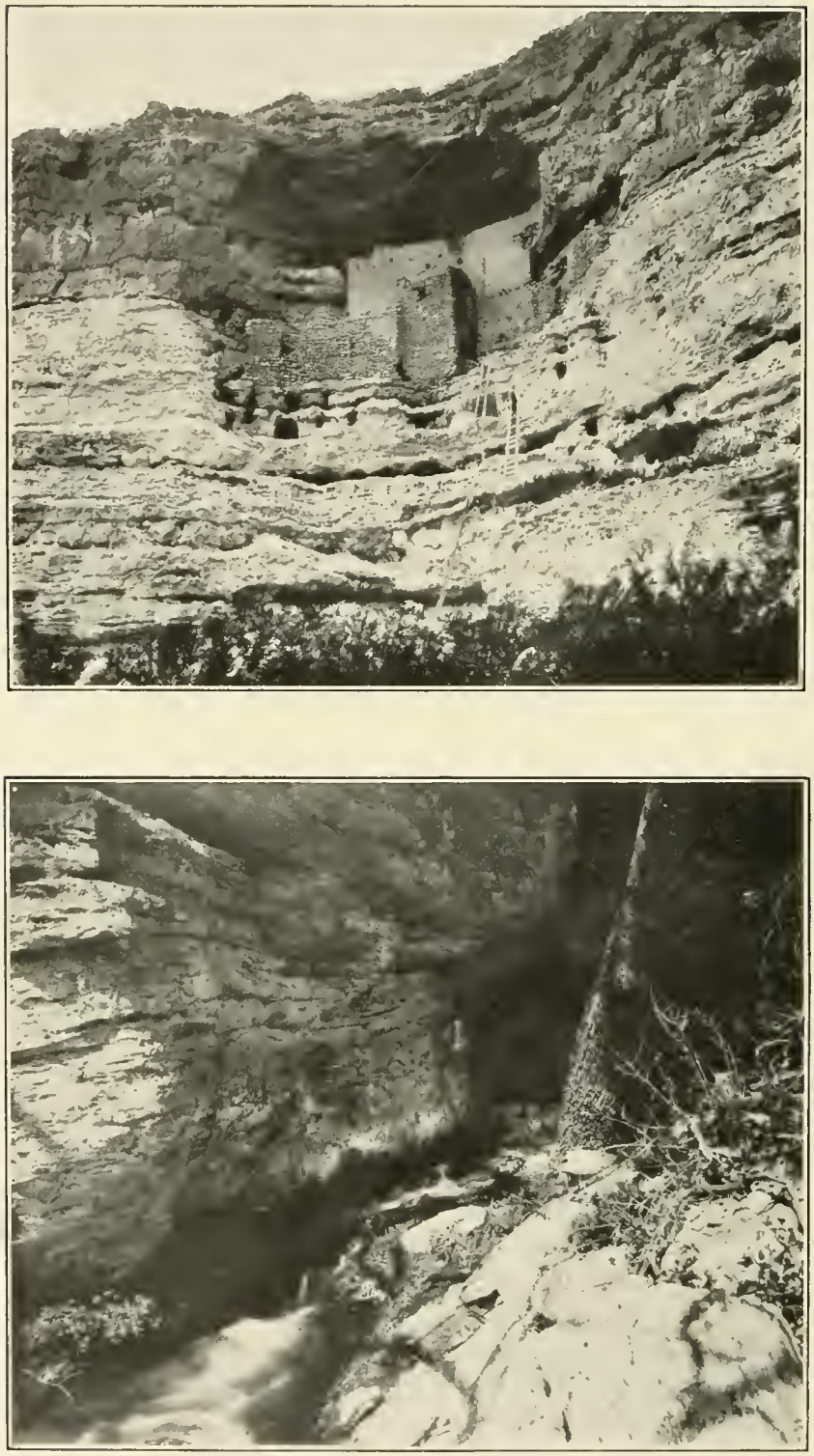
Sitgreaves, L., Report of an Expedition down the Zuñi and Colorado Rivers. *Sen. Ex. Doc. 59*, 32d Cong., 2d sess., Washington, 1853.

Reports of Explorations and Surveys . . . from the Mississippi River to the Pacific Ocean, vol. III, Washington, 1856. ("Whipple Survey.")

U. S. Geographical Surveys of the Territory of the United States West of the 100th Meridian. *Annual Reports*, Washington, 1875–78. ("Wheeler Survey.")

Hoffman, Walter J., Miscellaneous Ethnographic Observations on Indians Inhabiting Nevada, California, and Arizona. In *Tenth Ann. Rep. Hayden Survey*, Washington, 1878.

Mearns, Edgar A., Ancient Dwellings of the Rio Verde Valley. In *Pop. Sci. Mo.*, XXXVII, New York, Oct., 1890.



MONTEZUMA CASTLE (ABOVE) AND OUTLET OF MONTEZUMA WELL

MONTEZUMA WELL

The buildings herein considered have few points of likeness to New Mexican pueblos;[1] in details they are more nearly related to the ruins of habitations called *jacales*, on the Gila and its tributaries. The forts or fortified hilltops suggest the *trincheras* of Sonora and Chihuahua, in northwestern Mexico, and present architectural features distinguishing this type from true pueblos of New Mexico, Colorado, northern Arizona, and Utah, the fort or fortified hilltop being a southern and western rather than a northern and eastern type of structure.

Comparison of the ruins along the upper Verde with those on or near Walnut Creek shows clearly the influence of environment on human habitations. In the former region cliff-dwellings and cave habitations predominate, the latter because they could be easily excavated in the soft rock, whereas in the Walnut Creek basin the formations consist of granite and basalt. The construction of cliff-houses or cave-dwellings here being impossible, they are replaced by forts. Judging from the size and number of these forts, the conflicts between the inhabitants and the hostile tribes must have been severe.

RUINS ON THE UPPER VERDE RIVER

All evidence indicates that the upper part of the Verde Basin, like the middle and lower sections, had a considerable aboriginal population in prehistoric times. The valleys of the tributaries of the Verde also show evidences of former occupancy, almost every high hill being crowned by a ruin. The walls of some of these structures are still intact, but most of them are broken down, although not to so great an extent that the ground plan of the rooms can not be fairly well traced. Many river terraces, or elevated river banks, where agriculture was possible, are the sites of extensive ruins, as indicated by rows of foundation stones.

The most important and typical ruins along the middle Verde are Montezuma Castle and the aboriginal shrine, Montezuma Well, which are so well known that the author has merely introduced illustrations (pls. 79, 80) of them for comparative purposes.

The present record of unpublished studies begins with the consideration of cave-dwellings at the mouth of Oak Creek, from an archeologic point of view one of the least known groups of cave-dwellings in the Verde Valley.

[1] The author has repeatedly pointed out a distinction between the type of ruin called *jacales*, characteristic of southern and western Arizona, and that known to archeologists as "pueblos," so abundant in New Mexico.

Ruins at the Mouth of Oak Creek

The cavate rooms (pls. 81–84) in the bluff overlooking Oak Creek are good examples of cave domiciles artificially excavated in cliffs. This cluster of rooms, accompanied by a building above, is situated in the angle formed by Oak Creek and the Verde, about 50 yards from the Cornville-Verde road, having a wide outlook across the valleys of both streams. Although not so extensive as the cavate lodges found lower down the Verde, and somewhat smaller than most similar caves in the Rio Grande region, this cluster is representative of Verde Valley cavate lodges.

The rock of which the bluff is composed is a friable tufaceous formation, superficially much eroded by weathering. This rock is so soft that it could be readily worked with stone implements, as shown by certain peckings on the vault of the roof and on the walls of the rooms. Judging from the nature of the rock, it is probable that the face of the bluff above the river has been worn away considerably since the caves were deserted; the front walls have changed somewhat even in modern times.

Although these artificial caves have been known for some time, especially to people living in the vicinity, little detailed study has been given to them by archeologists. In his report on the lower Verde ruins, Mindeleff does not mention or figure them, and they are not discussed in other accounts. In 1898 the present author directed attention to the interesting character of these caves.[1]

A marked feature of cavate rooms in Arizona[2] is the almost unexceptional association with them of buildings constructed on the talus at their bases or on the mesa above them. Associated with the Oak Creek caves, as with the cavate dwellings of Clear Creek, lower down the Verde, there is a building (pl. 81) on the mesa above but none on the talus below. Although at present much broken down, this building presents strong indication of long habitation and is believed to have been occupied contemporaneously with the caves below, possibly by the same clans.

If the cavate rooms and the pueblo on the mesa were inhabited synchronously, the suggestion naturally occurs that they may have had two distinct uses: possibly one was for ceremonial, the other for secular, purposes; or one was for storage of food and the other for dwelling purposes. The author inclines to the belief that each of these two types was devoted to a distinct use, but he is unable definitely to substantiate this hypothesis. The ruin (pl. 81) on top of the bluff overlooking Oak Creek was an extensive village resembling a pueblo; some of its walls are well preserved. One can hardly

[1] In *17th Ann. Rep. Bur. Amer. Ethnol.*

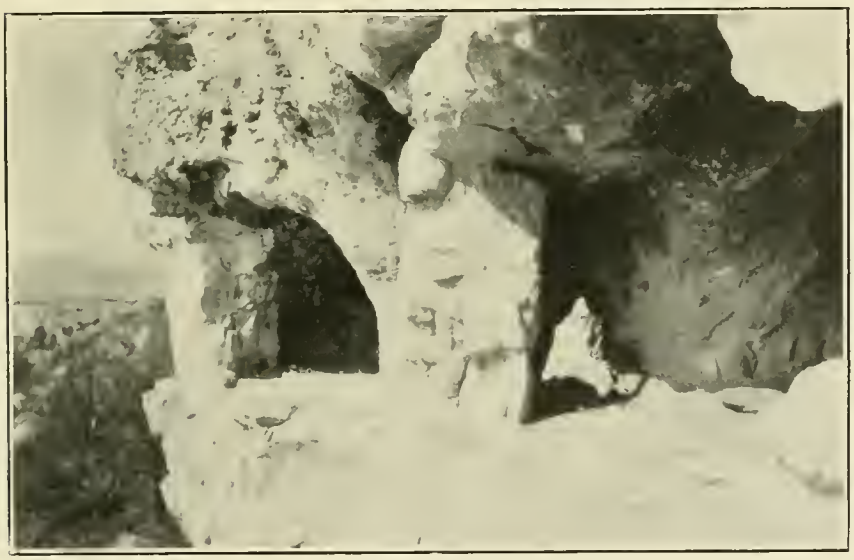
[2] Similar caves found on Clear Creek resemble in general those on Oak Creek, and there is no reason to doubt the tribal identity of the inhabitants of the two localities.

a. RUIN ON THE BLUFF ABOVE OAK CREEK CAVES

b. OAK CREEK CAVES

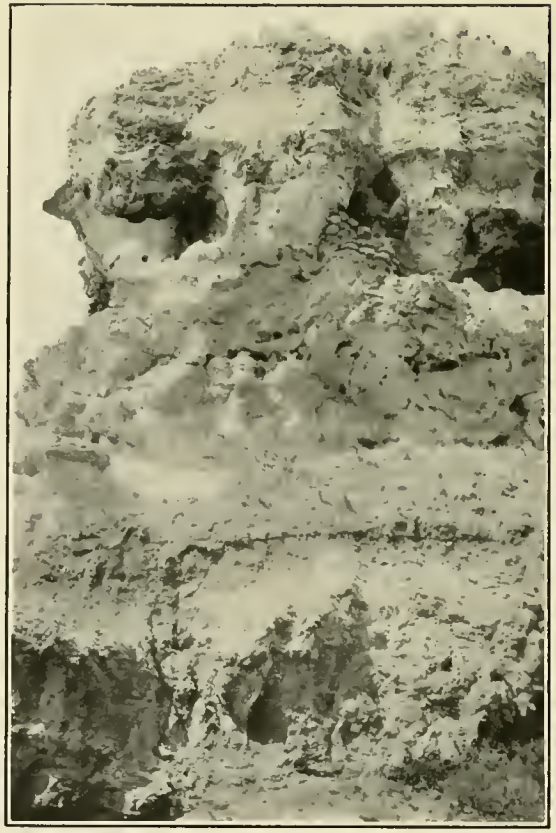
RUINS AT THE MOUTH OF OAK CREEK

a. MIDDLE SERIES



b. EASTERN END

CAVATE ROOMS OVERLOOKING OAK CREEK



a, EASTERN END

b, WESTERN END

CAVATE ROOMS OVERLOOKING OAK CREEK

CAVATE ROOMS OVERLOOKING OAK CREEK

suppose this structure to have been inhabited by people hostile to those occupying the cliffs below, nor is it reasonable to regard its walls as of a later or an earlier period of construction. It is known that a division of rooms into kivas and living quarters is a constant feature in most modern, and in some ancient, pueblos.[1] Possibly there was a corresponding duality in this cluster, the cavate lodges and the pueblo on the bluff having different functions.

While most of the walls of the Oak Creek pueblo have fallen, a few of the rooms are fairly well preserved. These are situated on the south side, rising from the rim of the precipitous bluff; the descent

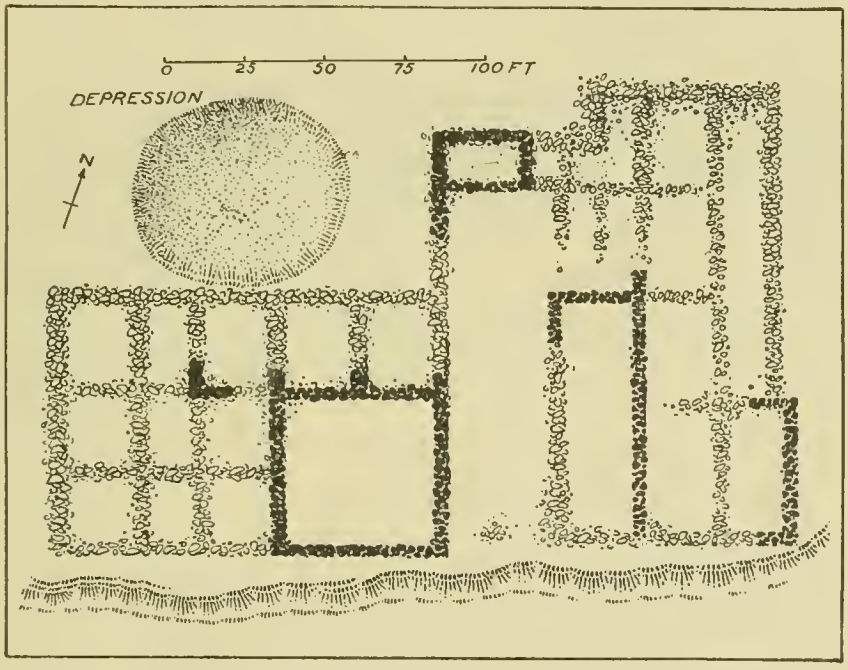


FIG. 55. Ground plan of pueblo on bluff overlooking Oak Creek.

on the north side is more gradual. An examination of the ground plan (fig. 55) shows that the total length (measured east and west) is 231 feet and the breadth 135 feet. Most of the rooms are fairly large; their walls are of undressed reddish-colored stones, bearing evidences that they were formerly plastered. The highest wall still standing is about 20 feet, while several walls are 15 feet, in height. The positions of projecting floor beams and of apertures which formerly received such beams indicate that the structure in its highest part originally contained three stories and was a pueblo.[2]

[1] It is known that there are no circular kivas in Verde ruins, and the rectangular ceremonial rooms (*kihus*) in this valley have not yet been differentiated from habitations.

[2] A pueblo is a compact community building, generally more than two stories high and terraced, the stories above the first having lateral entrances.

In all the outlines of rooms that have been traced there are no evidences of kivas (subterranean chambers specialized for ceremonial purposes), but at the northwestern corner, outside the walls, is a circular depression suggesting a former reservoir. Viewed from below or from the left bank of Oak Creek, the ruin with the line of cavate rooms beneath and the wall of the pueblo crowning the bluff forms a striking picture, as shown in the accompanying illustrations (pls. 81, *b;* 82). The caves below—that is, the rooms excavated in the side of the bluff—will be considered first.

The openings into these cavate lodges appear at two levels, those in the lower row being the more numerous. The front wall of the upper row has been almost completely destroyed by the elements. Three sections may be distinguished in the lower or main line of cavate rooms—western, middle, and eastern. While in general style of construction the rooms of all three sections are similar, the chambers vary to so great an extent in size, depth to which excavated, and in other particulars as to suggest that they were used for different purposes. The rooms of the western end (pl. 83), which are larger than those of the other two sections, are more easily approached. The cluster of rooms at the eastern end (pls. 83, 84) can not be entered from the others, but is approached by climbing the bluff (pl. 84) above the Cornville road. The broken openings of the western and middle sections face southward beyond Oak Creek, while those at the east face more toward the east.

In order to comprehend more fully the character of the site of these excavated rooms, let us consider a high cliff or bluff (pls. 83, 84) with a river flowing along its base, bordering which is a low talus of fallen stones, the débris from the wall above. From the top of this talus to the level of the floors of the cavate rooms is about 15 feet. The pathway follows a low bench in the cliff a few feet below the floor level, at too great a distance, however, for one to climb to the rooms, except at two points. Viewed from a level place across the creek the lines of cavate rooms appear as rows of irregularly shaped holes in the side of the cliff (pl. 81, *b*). The jagged openings indicate former entrances of caves artificially excavated in the rock, the marks of the workers' tools being visible on the walls.

The average depth to which these caves are excavated is 20 feet, and the whole length of the western and middle parts is about 207 feet, the former being 183 feet and the latter 24 feet. Attention is drawn to the fact that each of the 10 rooms composing the western series of cavate rooms is rudely circular or oval in form, none of the corners forming right angles. The floors of most of the rooms are approximately on the same level; their roofs are formed by the roof of the cavity, while the partitions consist of walls of the

rock left in place. There was evidently once a passageway (pl. 83, *b*) along the ledges in front of the line of entrances into the cavate rooms, and it likewise appears that many walls formerly closed the fronts, whose positions are now indicated by great jagged apertures. While only fragments of these front walls remain, it appears from one (in the middle series) still standing (pl. 81, *b*) that walls of this kind formerly extended along the whole length, from floor to roof, and were pierced for entrance.

There is no evidence that a building once stood on the talus in front of this line of cavate lodges (pl. 83, *b*), as found in connection with some similar habitations. The situation of the caves with relation to the cliff above would seem to afford evidence against such sup-

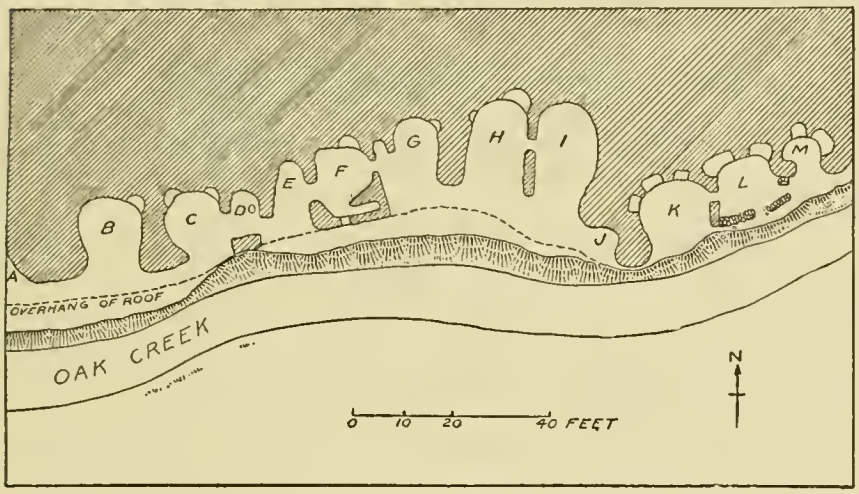


FIG. 56. Ground plan of cave rooms on Oak Creek (western end and middle).

position. It is doubtful also whether there were any rooms on the river bank, which was flooded regularly at high water.

The rooms of the western and middle series of Oak Creek caves are indicated on the ground plan (fig. 56) by the letters A–M. East of room J the partition separating the rooms of the western series from those of the middle series approaches so close to the edge of the cliff that it is impossible to pass around it from one room to another. The entrance to this series of rooms lies at the point A; the aperture is small and bounded by broken walls (pls. 81, *b;* 83, *b*). Once on the ledge, however, one can walk on a projection the whole distance from room A to room J without inconvenience, passing through many connecting passages. Room B, which is somewhat more spacious than A, has in one corner a small closet or niche; in C there are two of these niches, once used for containing food or water. No sign of front walls appears in

A, B, or C. Room D is now, as it probably always has been, really an arched passageway; in its floor is a mortar-like depression in which possibly grain may have been pounded. A solid rock support left by the prehistoric workman, in front of this arched passage, shows on its sides the marks of the builder's stone tools. Room E was apparently an open area, perhaps a recess or court rather than a living room, and, as there are no signs of a front wall, probably served as a porch for room F. At the edge of this porch is a shallow groove cut in the floor, extending at right angles to the edge of the cliff, in which it may be supposed the ancients rested their weapons before they discharged them at the enemy below.[1] The front wall of room F is well preserved, making this room the best in condition in the western series; it has a window and a closet, or niche, in the rear. The pear-shaped passageway into the adjoining room (G) is cut through a solid rock partition, the opening being just large enough for the passage of the human body. The remaining rooms (G, H, I, J), which are open in front, are comparatively large. There is an elevation in the floor forming a platform between rooms F and G, which may be likened to the banquettes in some other cavate lodges.

The middle series of cavate lodges at Oak Creek has three rooms (K, L, M); these are merely a continuation of the western series from which the room first mentioned (K) is separated by undisturbed rock. This room is almost circular in shape; the curve of the roof extends from the highest point (about 6 feet), in the middle, to the floor. The distance on the floor across the broken entrance (there is no front wall) measures 11 feet, and from the face of the cliff to the rear wall 15 feet. The surface of the floor, composed of the natural stone considerably worn, is smooth, almost polished. There are three small niches in the rear of the room, the bottoms of which are slightly below the floor level.

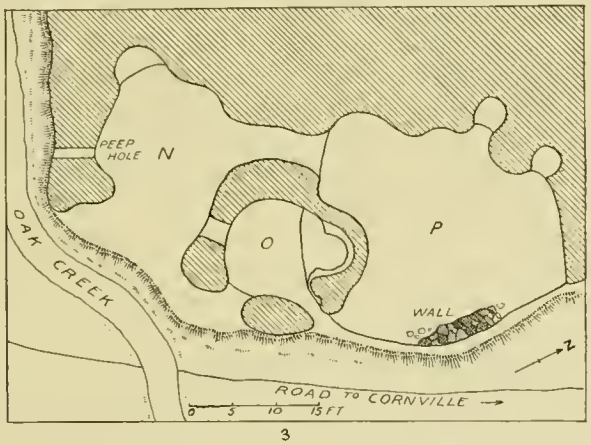
Room L is the only one in the middle series retaining a remnant of the front wall that once closed the entrances of these caves. The distance from this wall to the rear wall is 10 feet, the width of the entrance 14½ feet, and the height of the room 5 to 7 feet. There are two niches in the rear of this room and a shallow groove on the ledge in front, which projects beyond the wall at right angles to its length. Here also are two circular shallow depressions in the rock floor that might have been used as mortars for pounding corn or other seeds.

The doorways or passages between rooms L and K and L and M apparently remain in about the same condition as when the rooms

[1] Similar grooves are found on the East Mesa of the Hopi, overlooking the trail near Hano, which early warriors are said to have used for the same purpose.

were inhabited. Room M has one small niche and two large niches; the open front shows no vestige of masonry.

Excavated in the northeastern corner (pl. 84) of the bluff, somewhat to the east of the middle series of rooms and separated therefrom by an impassable cliff, are the eastern caves, which open toward the east, overlooking the Cornville-Verde road and Oak Creek. There are but three rooms (N, O, P) in this cluster (fig. 57). Room N faces more to the southward than the remainder. This room is irregular in shape. The rear wall is 21 feet from the edge of the cliff at the floor level; the dome-shaped roof, which is blackened with smoke, slopes uniformly backward, the highest point being near the entrance; the average height is 5 feet. A peephole cut through the rock partition looks out over Oak Creek, on the southern side. One of the walls contains a niche. Room N opens into rooms O and P. The



3

FIG. 57. Ground plan of cave rooms on Oak Creek (eastern end).

former is about 8 feet high; this can be entered by a passageway from front and side. The roof is vaulted; the floor on the north side is slightly raised. Passage through the narrow opening from one of these rooms to another can be effected only by crawling on all fours. Room P has a vaulted roof, averaging 7 feet in height; there are two niches at the floor level, the openings of which are pear-shaped.

In their general features the Oak Creek cavate lodges,[1] as shown in the preceding paragraphs, are not unlike structures of similar character in the Verde Valley. They closely resemble inhabited caves in various parts of the world, excavated in similar rock formations by people of the Stone Age.

[1] No sufficient reason to reject the word "cavate" occurs to the writer nor does he know of any better term that has been suggested by those who object to its use to designate caves of this type. Most of these artificial caves are found in cliffs and may be properly called cliff-dwellings, especially those which have buildings in front of them. They undoubtedly grade into other types, as natural caves having houses built in them, but the term is the most expressive yet suggested for cliff-rooms artificially excavated.

Cliff-houses of the Red Rocks

The cavate rooms of Oak Creek here described and illustrated are not the only form of cliff-dwellings in the upper Verde region. We find there also walled houses built in caves or in recesses protected by an overhang of the cliff, in which little or no artificial excavation is apparent. The largest known cliff-houses of this type along the upper Verde are situated in the Red Rocks, which can easily be seen across the valley from Jerome, Arizona. The geologic character of these rocks and the peculiar structure of the caves in which they occur impart to these cliff-houses a form resembling the cliff-dwellings of the Navaho National Monument in northern Arizona, the characteristic feature being that the rear wall and in some cases the side walls of the rooms consist of the cave wall. The latter walls are built so that their ends join the rear wall of the cave, unlike pueblos, which are independent of cliffs for support so far as lateral walls are concerned. This type, like the ledge-houses in the Mesa Verde National Park, Colorado, forms a connecting link between cavate lodges and cliff-dwellings, the essential differences being that the former are artificial excavations while the latter are constructed in natural caves.[1] In some of the rooms of cliff-houses of the most independent construction, the walls of the cliff constitute rear or side walls of the dwellings, so this feature can hardly be said to indicate any cultural difference; it is rather an expression of geologic environment, a difference that is worth consideration and may be convenient in classification.

The aboriginal habitations discovered by the author in 1895 in the Red Rocks[2] belong to the type of cliff-houses rather than to that called cavate lodges, the latter being represented on Oak and Clear Creeks.

Some of the smaller cliff-houses on the upper Verde and its tributaries have a characteristic form, approximating more closely those in Walnut Canyon, near Flagstaff, than they do those of the San Juan drainage.[3] This difference is due largely to the character of the rock formation and the erosion of the cliffs in which the first-mentioned dwellings are situated, but is also in part traceable to the composition of the clans that once inhabited them.

In Montezuma Castle (pl. 79), the typical cliff-dwelling in the Verde Valley, there are a main building and several smaller houses, which are duplicated on the Sycamore and other tributaries of the upper Verde.

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[1] Several of the Verde cliff-dwellings are simply natural caves whose entrances have been at least partially walled up. The external differences between these and artificial caves closed by a front wall are too slight perhaps to be considered. The method of formation of the cave, whether by nature or by artificial means, is more important as a means of classification.

[2] See *17th Ann. Rep. Bur. Amer. Ethnol.*

[3] The author regards these as closely related to the ledge-houses of the Mesa Verde, although exteriorly they are closely allied to cavate lodges and may be situated in artificially excavated caves.

The cliff-dwellings of the Red Rocks, built as they are in a rock formation different from that in which Montezuma Castle is situated, have certain architectural dissimilarities which are evident from comparison of the illustrations.

Honanki and Palatki, the principal cliff-houses in the Red Rocks, may be visited from Jerome, Arizona, by a more direct road than that from Flagstaff. This road passes through the valley settlements to Cottonwood, near which place it crosses the river. Above and just beyond a ford there are low mesas on which are situated ruins,[1] the walls of which can be seen from the crossing. (Pl. 89.) From the ford the road is fairly good as far as Windmill ranch, and thence is passable with wagons to Black's ranch, at the mouth of one of the canyons of the Red Rocks. As there is always water in this canyon, the mouth of which lies midway between Honanki and Palatki, a short distance from each, it is a favorable place for a permanent camp. The canyons in which the two ruins are situated are waterless.

Several small cliff-houses are found in this and neighboring canyons, and there are many caves showing evidences of former occupancy as mescal camps by Apache or others, but the main interest centers in Honanki and Palatki, the largest cliff-houses yet discovered in the Verde region with the possible exception of Montezuma Castle.

As already stated, it is evident that the character of the rock of the cave in which these two great ruins are situated is different from that in which Montezuma Castle stands. Like the latter, the small cliff-house in Sycamore Canyon is literally built in a recess in the cliffs, the roof of the houses being a short distance below the roof of the cavity.[2] In Honanki and Palatki, however, the opening is large and more in the nature of a cavern with a slight overhanging roof high above the tallest building. In these ruins there is no refuse-heap back of the inner rooms, the wall of the precipice serving as the rear wall of the room.

The cliff-dwellings of the Red Rocks are more closely related architecturally to those of the Navaho National Monument,[3] in northern Arizona, than to Montezuma Castle. They differ also from the ruin at Jordan's ranch, which is in reality a ledge-ruin, being built in a natural cave following the line of softer rock strata, having the front closed by an artificial wall extending from base to roof.[4]

The two ruins, Honanki and Palatki, discovered by the author in 1895, were the first cliff-dwellings in this part of the Verde region made known to science.[5] At that time photographs of these ruins were

[1] There are two ruins on the mesa above this ford, on the left bank of the river. These can be seen from Jerome with the aid of a field glass.

[2] The author has not yet determined whether the cave at Montezuma Castle is wholly natural.

[3] See *Bull. 50, Bur. Amer. Ethnol.*

[4] Several ruins of this type occur in the rock under Montezuma Castle; the ruins in Walnut Canyon, near Flagstaff, also belong to this type.

[5] *17th Ann. Rep. Bur. Amer. Ethnol.*

published, accompanied by descriptions of the various rooms and minor antiquities. The author adds here but little to his former description of the ruins, but has introduced better ground plans (figs. 58, 59) of them than any yet published. Although reports of ruins

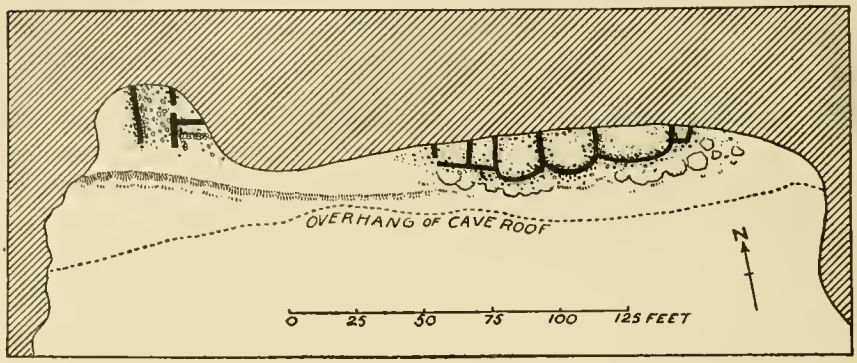


FIG. 58. Ground plan of Palatki.

much larger than these of the Red Rocks, situated higher up on the Verde, were brought to the author in 1895, he is convinced that there is but slight foundation for them. There are undoubtedly several small cliff-houses and many natural caves, as "Robber's Roost,"

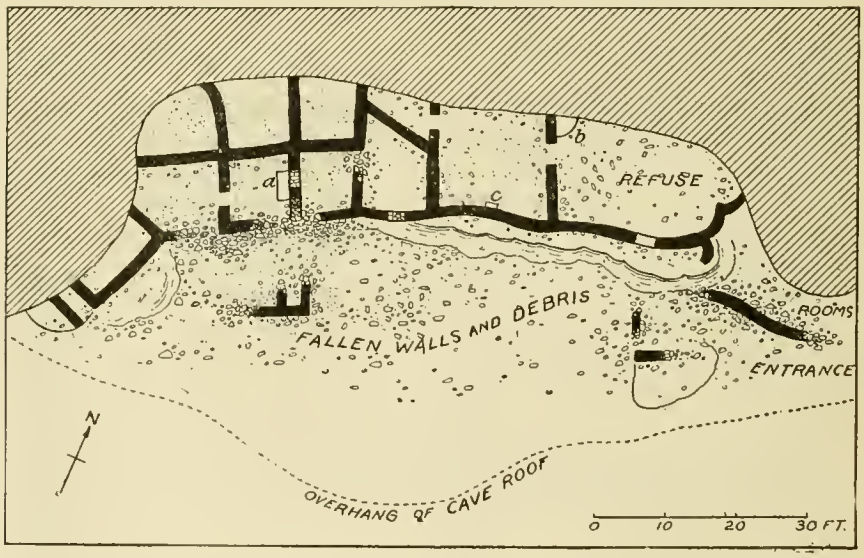
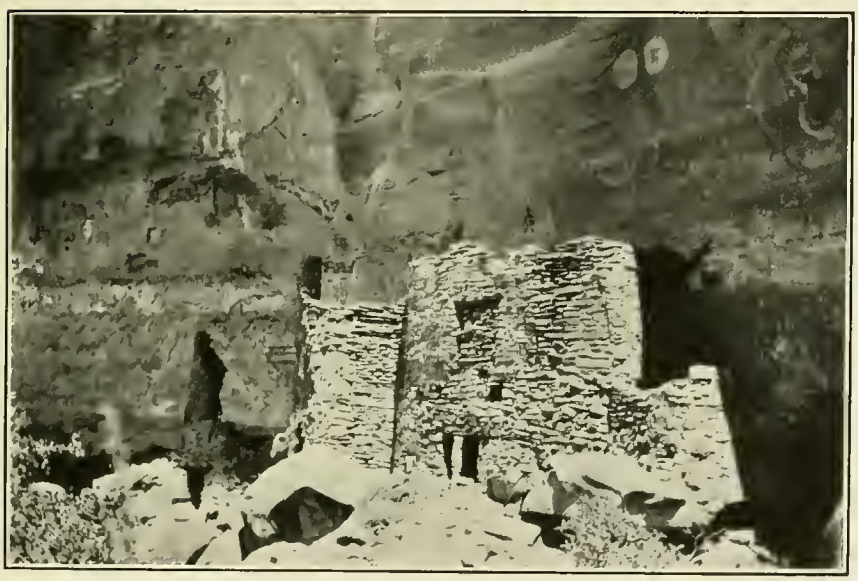


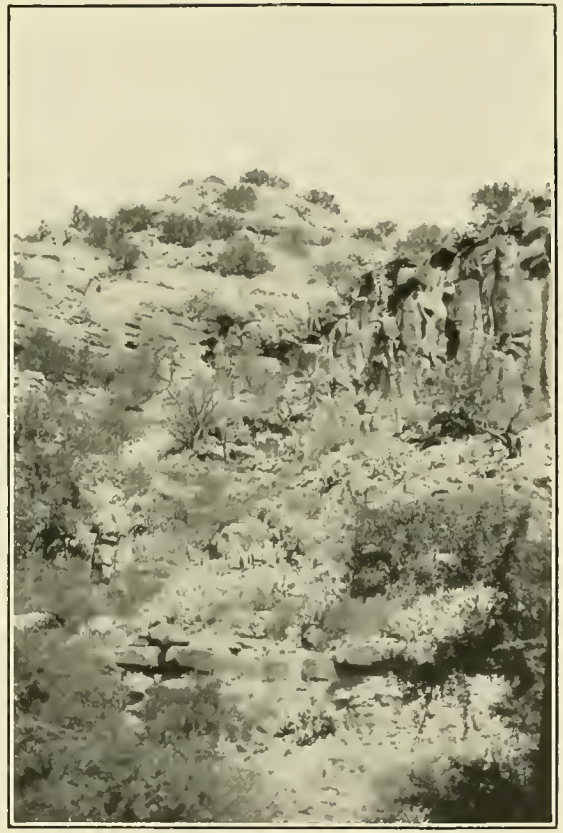
FIG. 59. Ground plan of Honanki.

in the Red Rocks, but no cliff-dwellings of great size are to be found between the Red Rocks and the Chino Valley. Palatki (pls. 85; 86, *a*) lies in the canyon east of Black's ranch, a short distance therefrom, and Honanki about the same distance to the west.



RUIN BELOW MARX'S RANCH (ABOVE), AND PALATKI

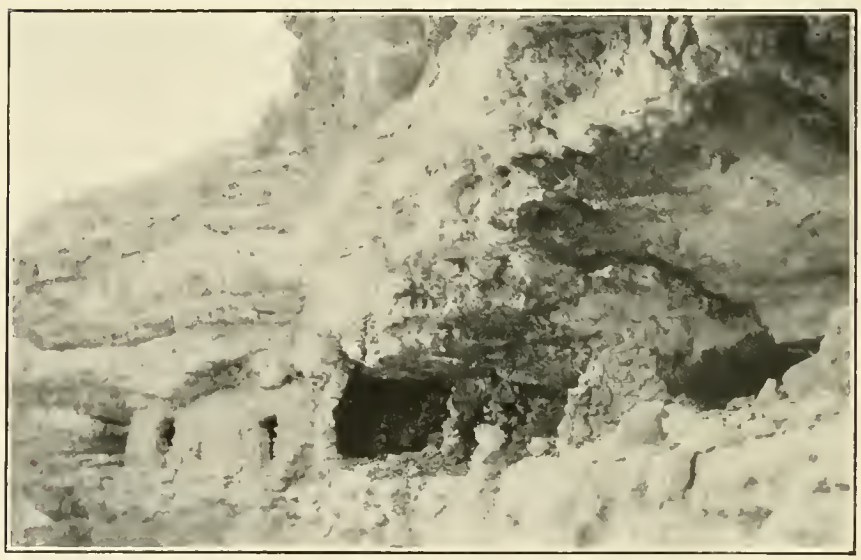
a



b

PALATKI (*a*), AND BASALT COLUMNS ON THE UPPER VERDE RIVER (*b*)

AT THE MOUTH OF BLACK'S CANYON



NEAR JORDAN'S RANCH

CLIFF-HOUSES ON THE UPPER VERDE RIVER

On approaching Palatki from Black's ranch by the trail at the base of the cliff a number of natural caves are encountered that evidently were formerly used by the Apache, as their smoke-blackened walls are decorated with characteristic Apache pictographs.[1] No indications of house walls were discovered in these caves, and there is only scanty evidence of occupancy prior to that of the Apache, which was clearly very recent.

Cliff-house at the Mouth of Black's Canyon

The small cliff-house at the entrance to Black's Canyon, on the west side, is one of the interesting forms of cliff-houses in the Red Rocks, differing from any yet described in the Verde region. The ruin (pl. 87) spans a narrow crevice, resting partly on the top of a detached

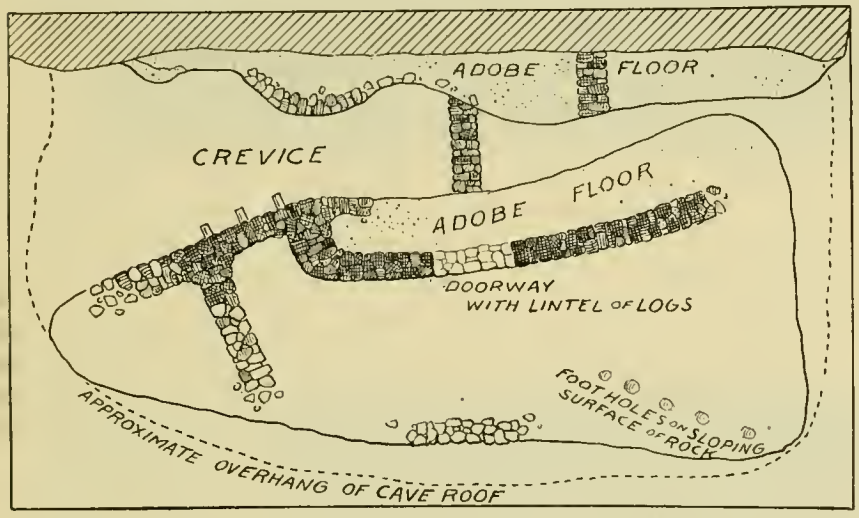


Fig. 60. Ground plan of cliff-house at the mouth of Black's Canyon.

bowlder and partly on a ledge under the wall of the cliff above; in other words, the house is situated in part of a recess out of which the bowlder has fallen.

Many pictographs, consisting of zigzag figures, dots, and parallel lines, resembling "counts" and rude faces, occur in the neighborhood of this ruin; these are not pecked in the rock surface, as are most ancient Pueblo pictographs, but are painted in white, red, or other pigments. The ground plan of this ruin is shown in the accompanying illustration (fig. 60) and its general appearance viewed from the hills back of the camp in plate 87. This ruin is much dilapidated, most of its walls having fallen; a considerable section, however, containing a doorway or window, can still be seen. The house is

[1] Most of the cliff-dwellers' pictographs are incised, while those made by Apache are painted.

of stone, but there are also fragments of adobe walls and sections of plastered clay floors adhering to the ledge and adjacent parts of the bowlder. As before stated, between cliff and bowlder is a crevice once bridged by the buildings. Two or three beams project from the top of the bowlder opposite the ledge, indicating that the space between the bowlder and the sides of the cliff was formerly floored or roofed, the ends of the supporting beams resting on the bowlder and the ledge. This floor was evidently supported in part by a stone wall built in the crevice, remains of which are shown in the ground plan. Possibly this wall formerly served as a partition between two small basal rooms occupying the crevice, the remaining walls of which are no longer traceable.

A row of shallow pits cut in the surface and sides of the bowlder occupy approximately the position indicated in fig. 60; these served as footholds and apparently furnished the only means by which the inhabitants of this building could gain access thereto.

Ledge-houses near Jordan's Ranch

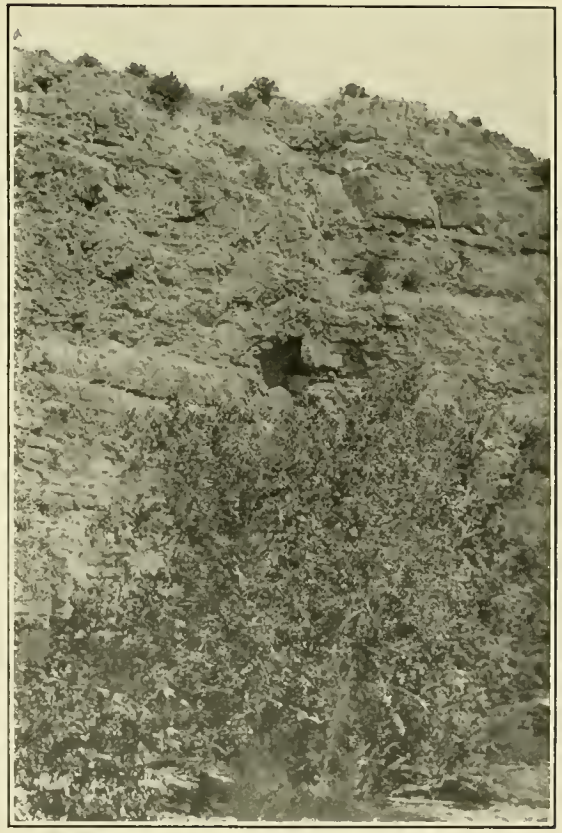
The small cliff-dwellings near Jordan's ranch, about 6 miles from Jerome, belong to the type known as ledge-ruins, i. e., natural caves of small extent having the fronts closed by walls of masonry. There are several similar ledge-ruins in the valley, but the Jordan ruins are probably the best preserved. Several ruins of this type are found in the cliffs below Montezuma Castle, as shown in plate 79.

The Jordan ruins are situated in the cliffs on the right bank of the Verde about 50 feet above the river bottom and can be reached by an easy climb over fallen stones. There are several ledge-houses in this locality, three of which face east and the fourth north, all overlooking the river. The soft limestone composing the cliff is here stratified, the strata being slightly tilted and in places very much eroded; the formation is colored white and red. The cave walls are much blackened with smoke. It was possible to enter readily all but one of these houses; the trail leading to the fourth has been obliterated by erosion.

The largest of the Jordan ruins (pls. 87, 88), which is 175 feet in length, extends approximately north and south. About half the front wall and two end walls are still intact but the intermediate section of the front wall is broken. The cliff slightly overhangs the house, forming a roof; the walls extend from the edge of the cliff to the roof. The rear wall of the cliff forms the corresponding wall of the rooms, as indicated in the ground plan (fig. 61)—a characteristic feature of Verde Valley cliff-houses.

On a lower level of the cliff, just beyond the Jordan ruins, are two rooms, with blackened walls, connected by an almost cylindrical

NEAR JORDAN'S RANCH



IN SYCAMORE CANYON

CLIFF-HOUSES ON THE UPPER VERDE RIVER

passageway through the intervening partition. The front wall of one of these rooms is pierced by a round peephole, which commands a view upstream. The walls of this ruin are thick except in front, where they are badly broken down. On their inner plastered surfaces marks of human hands appear.[1]

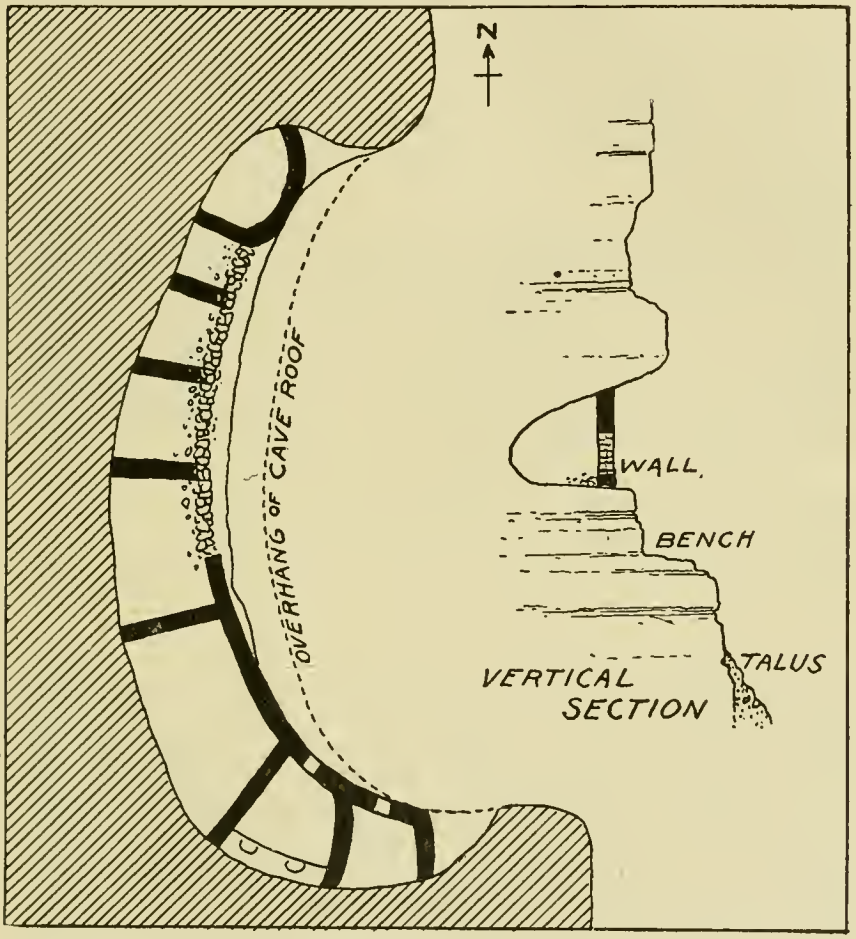


FIG. 61. Ground plan and section of ledge-house near Jordan's ranch (height of front wall about 50 feet).

RUINS IN SYCAMORE CANYON

The presence of ruins in Sycamore Canyon (Dragoon Fork of some of the older maps) was reported, but on investigation the author was unable to find any large buildings on this tributary of the Verde River, although he examined several ruins—forts, cavate rooms, and

[1] These are the ruins about which an imaginary story was published in a Jerome (Arizona) newspaper, later copied into journals of wider circulation, that they were still inhabited.

walled-up caves or cliff-dwellings. Higher up the canyon is called Sycamore Basin; this also is reputed to contain cliff-dwellings and other evidences of former habitation, but was not visited.[1]

In Sycamore Canyon, about a mile from the junction of the Sycamore and the Verde, a fine spring bubbles out of the ground, the outflow from which formed a considerable stream at the time of the author's visit. Half a mile farther up the canyon is a well-preserved but inaccessible cliff-house, having an upper and a lower front wall, as shown in the accompanying illustration (pl. 88). This ruin is situated in a cave in the side of the cliff, the approach to which is worn away. The stones of the upper front wall of the inner building are supported by upright logs.

About 2 miles from the junction of Sycamore Creek and the Verde, on both sides of the canyon, even where the walls are steepest, are natural caves showing evidences of former occupancy.[2] For the greater part the walls in these caves have tumbled down, but remnants of front walls are still standing. Here and there the volcanic rock is of columnar form. (Pl. 86, *b*.) The formation of the cliff in which the caves are situated is uniformly soft and tufaceous; the color is commonly reddish, in places almost white.

Apparently the prehistoric population of Sycamore Canyon was small and the area that could be cultivated was meager.

On a level place to the left of the road from Jerome as one descends to the mouth of the Sycamore there is a pueblo ruin which is much dilapidated.

Ruins in Hell Canyon

Hell Canyon is a branch of the Verde Canyon and the small stream flowing through the former discharges into the Verde a short distance from the mouth of Granite Creek. The author had been informed that there were extensive ruins of cliff-dwellings in Hell Canyon, but although there are here several stone ruins of the fortress type, referred to by ranchmen as "corrals," there are few remains of cliff-houses. One ranchman declared the Hell Canyon ruins to be the largest on the upper Verde; this may be true, but no ruins of great size were visited by the author. Not far from the junction of this canyon with the Verde is a low bluff of soft stone, suggestive of the Oak Creek formation, which looks as if it once might have been honeycombed with cavate rooms. These have now disappeared, only a hint of their former existence remaining. The rock here is suitable for cavate houses like those at the mouth of Oak Creek, and there is level land adjacent that would serve for agricultural purposes.

[1] There is evidence of the existence of a large ruin on the rim of the mesa or the point of the tongue of land between the Verde and the mouth of the Sycamore, 25 miles from Williams, but this ruin was not visited.

[2] It is impossible to drive up this canyon, but the trip can easily be made on horseback.

Ruins near Del Rio

The ruins in the neighborhood of Del Rio, most of which are on the summits of low mounds, have the same general form. Three of these ruins, one on the Banghart ranch, described by Hinton,[1] were visited. Walls of ruined houses, of small size and inconspicuous, are to be seen to both the right and the left of the railroad, near the station.

The ground plan of these ruins has been almost obliterated, as the stones from the fallen walls have been carried away for use in the construction of modern buildings in the neighborhood. Most of these buildings seem to have consisted of small clusters of rooms. Few of them are situated very far from the streams, and the more copious the supply of running water the more extensive are the signs of former aboriginal life. The ruins at Del Rio belong to the Chino series, the characters of which they possess in all essential particulars.[2]

Ruins near Baker's Ranch House

The Baker ranch lies on the right bank of the Verde about 7 miles above the mouth of Sycamore Creek. Several forts, cave habitations, and gravelly terraced mesa ruins (pl. 99) exist near the house now owned by Mr. Perkins.[3]

Following up the stream about 2 miles to the Government road, the author observed on a malpais hill, about a mile from the river, obscurely outlined walls of what was formerly a large fort. Within an inclosure bounded by the fallen walls are the remains of several rooms. Although this is not one of the best-preserved or largest forts on the upper Verde, its walls are still breast high. About 2 miles down the Verde from the Baker ranch house is a cave on the walls of which is a circular pictograph painted in black, probably Apache.

A mile down the Verde from Baker's (Perkins') ranch house, on the right bank of the river, are the remains of a cliff-house of considerable size, the ground plan of which is shown in figure 62. A few years ago the walls were in good condition and the structure was then regarded as a fine example of a cliff-house. Owing to the fact that this ruin lies in the surveyed route of the proposed railroad from Cedar Grove to Jerome, most of its walls will have to be destroyed when the road is built. The cave in which the ruin is situated is about 40 feet in depth and about 34 feet in width (from north to south wall) at the entrance; the height of the floor above the creek is 50 feet. On the plain in front of the cave, between the talus and the river, are fallen walls of a small pueblo from which many stones

[1] Hinton, Handbook to Arizona, p. 419.

[2] Del Rio, sometimes called Chino, is not a town but consists merely of a section house on the Santa Fé, Prescott & Phoenix Railroad.

[3] Mrs. Baker, who formerly lived here, is reported to have made a collection of archeologic objects, among which is said to have been an obsidian ax.

have been removed recently for use in the construction of a neighboring wall, but enough of the foundation stones remain to enable tracing the general ground plan.

Although this cave is a natural formation, in the rear are niches or cubby-holes evidently artificially excavated. The roof is about 15 feet above the floor of the rooms. The cave floor is covered with fallen stones upon some of which the foundations of the remaining walls still rest. Evidently this ruin has been considerably dug over by relic seekers, for in the fine dust which covers the floors are found charcoal, fragments of pottery, stones showing artificial work-

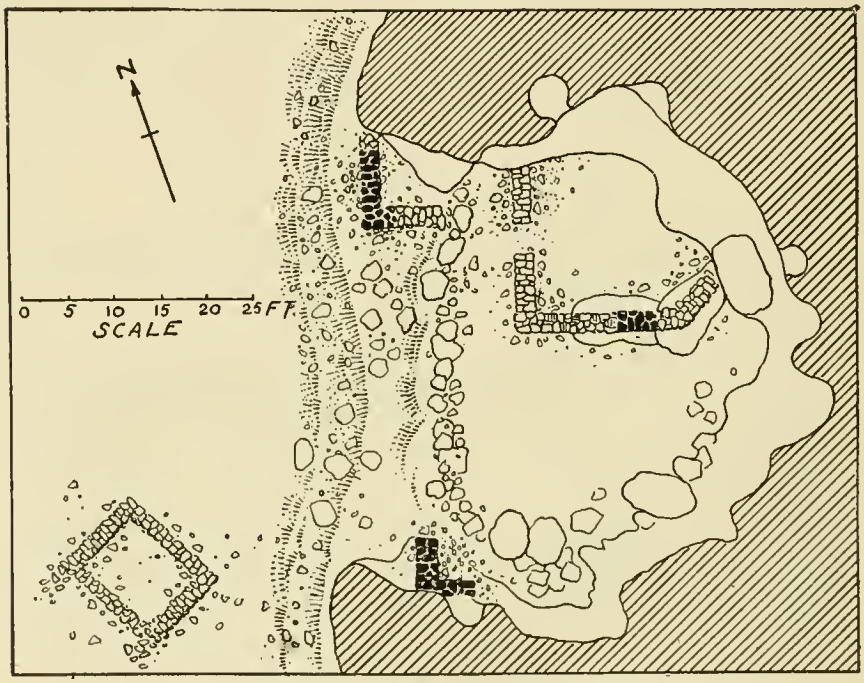


FIG. 62. Ground plan of cliff-dwelling at Baker's ranch.

ing, fragments of corncobs, twine, and other objects. It is said that a few fine specimens have been removed from this débris, but nothing of value was found by the author. The remnants of several plastered walls painted red can still be traced.

RUIN NEAR THE MOUTH OF GRANITE CREEK

Granite Creek, on which the city of Prescott is situated, discharges its waters into the Verde not far from Del Rio. About 2 miles down the Verde from the mouth of Granite Creek, the stream makes an abrupt bend by reason of a volcanic cliff rising perpendicularly from the river. This cliff is crowned by a large fort (pl. 95) of aboriginal

construction. The ruin[1] is situated almost due north of Jerome Junction, from which it can be reached by the road which turns at

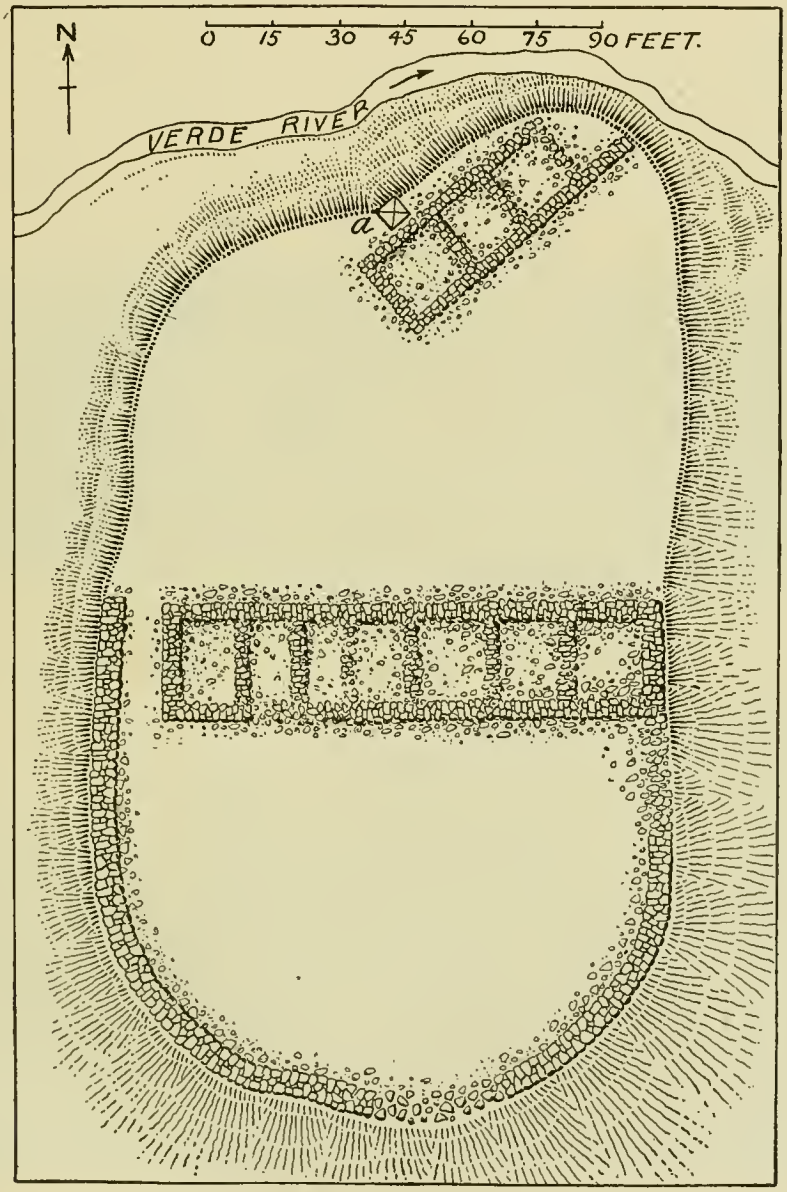


FIG. 63. Ground plan of fort near the mouth of Granite Creek.

Del Rio at right angles to the railroad and continues eastward to the mouth of Granite Creek. A visit can be readily made by wagon

[1] This is probably one of the ruins mentioned by Hinton, in his Handbook to Arizona.

from Del Rio by following the bed of the Verde. The great trachyte cliff rises precipitously about 300 to 400 feet above the river on the eastern, northern, and western sides, but on the south the approach, although steep, is more gradual; even here access is difficult. Approached from the river, the ruin presents the appearance of a castle towering above and commanding a view of the stream.

The general ground plan (fig. 63) of the ruin is roughly oval, with its longer axis extending north and south. The northern part is without a high wall, the precipice, from the edge of which it rises, serving the purpose of defense in that direction; but the southern part is protected by a high massive wall 320 feet long, fairly well preserved, and provided with an entrance at the southern extremity. The short axis of the ruin, measured from one extremity of the south wall to the other, is about 125 feet in length.

The northern and southern sections of the ruin are separated by a row of several rectangular rooms. The distance of these structures from the southern entrance is 87 feet, and from the nearest point of the northern section, 65 feet. The section south of these rooms appears to have been an enclosed plaza, without houses. In the northeastern part of the northern section are several rooms the combined length of which is 61 feet.

The walls of this fort and of the included buildings average 6 feet in thickness; they contain no mortar.

This ruin is evidently the one mentioned by Hinton, as follows (pp. 419–20):[1]

> Four miles below the place described, there is a hill overlooking the Verde River, with a series of ruins of stone houses, inclosed by a stone wall on the south side, which in places is 20 feet high and 12 feet wide. The other sides of the hill are abrupt and precipitous, and 200 to 300 feet perpendicular.

LIMESTONE BUTTE RUIN

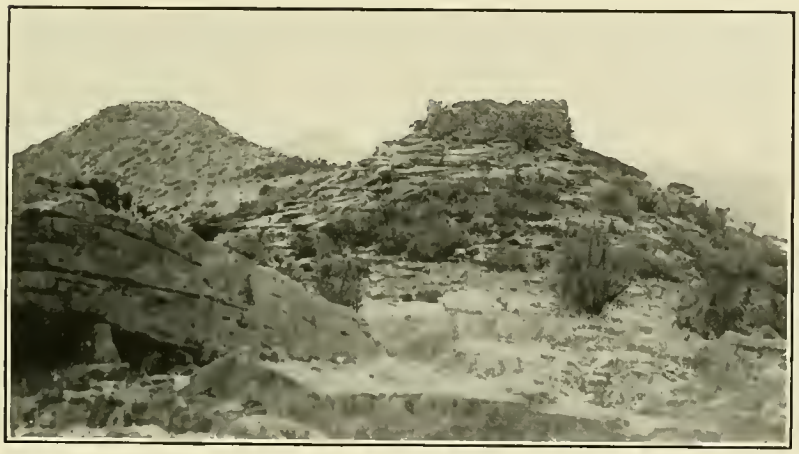
The Limestone Butte ruin (pls. 88–91), situated about 6 miles west of Jerome Junction and 16 miles north of Prescott, is one of the best preserved of the hilltop forts. It crowns a limestone ridge commanding fine views of the valleys to the east and west and of the distant Juniper Mountains to the northwest, with the Chino Valley and the distant peak called Pichacho. To the west lies Williamson Valley and to the south the mountains surrounding Prescott. The approach to this ruin on the east is more abrupt than that on the west. An old Government road which runs through Aztec Pass lies at the base of the ridge on top of which the ruins stand. This ridge rises 500 to 600 feet above the neighboring valley.

The general plan (fig. 64) of the Limestone Butte ruin is rectangular, the orientation slightly east of north. The walls are solid

[1] Hinton, Richard J., Handbook to Arizona, San Francisco and New York, 1878.

LIMESTONE BUTTE (ABOVE) AND CORNVILLE RUINS

a. FROM THE NORTH



b, FROM THE SOUTH

c, WESTERN WALL

LIMESTONE BUTTE RUIN

a, INTERIOR

b, WESTERN SIDE (FROM BELOW)

LIMESTONE BUTTE RUIN

masonry, well preserved, averaging about 8 feet in height and 4½ feet in width. On the western side the foundations conform more or less with the edge of the cliff, the face of which is sinuous; the other walls are fairly straight. The inside north-south measurement is 69 feet; the east-west, 27½ feet.

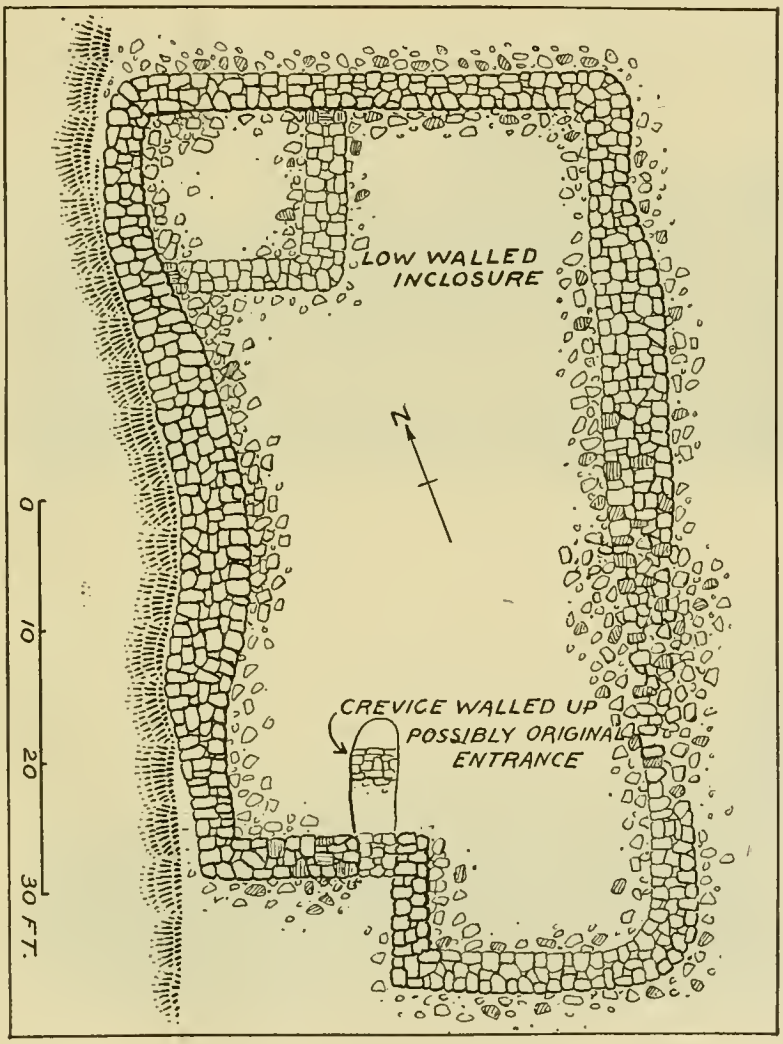


FIG. 64. Ground plan of Limestone Butte ruin.

No trace of mortar remains and the component stones of the walls are roughly dressed. The northern angle is almost wholly occupied by a small low-walled room, but the rest of the inclosure is without débris; the floor is solid rock. At a southwestern angle of the surrounding wall there was originally a crevice in the floor, since

walled up, suggesting the former presence of an entrance from below, but the adjacent walls have fallen to so great an extent that its purpose is difficult to determine. Below the western wall, the curve of which is shown in the accompanying views (pls. 90, *c*; 91, *b*), is a rude wall suggesting a cave-room, the other walls of which are obscurely indicated.

Viewed from the north, almost entire walls are seen, the foundations of which at certain places are large projecting bowlders. (See pl. 91, *a*, *b*.)

RUINS ON WALNUT CREEK

Walnut Creek is a small stream the waters of which at times flow into the Chino, but which, on the occasion of the writer's visit, were lost in the sands about 8 miles below old Camp Hualapai. In the report of Whipple's reconnoissance the stream bears the name of Pueblo Creek, from certain "pueblos" on the hills overlooking it, which he described, but the name is no longer applied to it. The ruins of Walnut Creek are of two kinds, one situated on the low terrace bordering the creek, the other on the hilltops. The stream is formed by the junction of two branches and the valley is continuous from Aztec Pass to the point where it merges into Chino Valley.

There is evidence that Walnut Valley had a considerable aboriginal population in prehistoric times. A number of forts and many remains of settlements strewn with pottery fragments and broken stone artifacts were found. Here and there are mounds, also irrigation ditches and pictographs.

A few years ago Walnut Valley had a number of white settlers and a post office,[1] but the families have now dwindled in number to three or four, and the place is characterized chiefly by abandoned houses. Camp Hualapai is deserted, the adobe houses shown in the accompanying illustration (pl. 92) being almost the only reminder of its former existence.

Historical Account

Whipple was the first to mention the numerous ruins ("pueblos" and forts) and other evidences of a former aboriginal population in Walnut Creek Valley. Subsequent to his visit no new observations on them appear in published accounts of the ruins of Arizona, and no archeologist seems to have paid attention to this interesting valley, a fact which gave the author new enthusiasm to visit the region and inspect its antiquities. These seemed of special interest, as Whipple's account was inadequate as a means of determining their relations with other aboriginal ruins in the Southwest. Who built the

[1] The post office was removed to Simmons, in Williamson Valley.

OLD CAMP HUALAPAI AND MOUNT HOPE

NEAR AINSWORTH'S RANCH

AZTEC PASS

VIEWS IN WALNUT VALLEY

structures and who are the descendants of the builders, are important questions.

In ancient times there was a well-worn Indian trail from the Colorado River, past Mount Hope, through Aztec Pass, down Walnut Creek, and across Williamson and Chino Valleys to the Verde. This trail, used by later American explorers, was doubtless the one followed by some of the early Spanish missionaries in their efforts to reach the Hopi Indians from the California side. Although the route taken by early Spanish travelers in crossing the country west of the Hopi villages is more or less problematical, it would seem that Oñate, in 1604, may have crossed the divide at Aztec Pass (pl. 93, *b*), and that Father Garcés, 172 years later, may have followed this trail past Mount Hope and down Walnut Creek. The Yavapai ("Yampais") were numerous in this region at that time and much later, as indicated on the few maps and descriptions which have come down to us.

In 1853 Sitgreaves followed the same Indian trail over Aztec Pass, crossing the country afterward traversed by Whipple, but, although he must have seen several ruins in this region, he mentions none, nor do others who followed approximately the same route, namely, Beale's road, known also as the Government road.

There is considerable arable land lying along Walnut Creek (pl. 93), which is continually shifting, owing to the inroads made by the stream, hence it is hardly probable that the flats now seen are those once cultivated by the Indians. It may be for this reason that the ancient farmhouses were built on the tongue-shaped terraces or on gravelly mesas bordering the stream, where the ruins are now found.

The forts were built on the summits of the highest prominences both for protection and for the sake of obtaining a wide view up and down the stream, and it is an instructive fact in this connection that one rarely loses sight of one of these hill forts before another can be seen. By means of a system of smoke signals news of an approaching foe could be communicated from settlement to settlement from one end of Walnut Valley to the other, giving the farmers in their fields skirting the stream opportunity to retreat to the forts for protection.

The ruins in Walnut ("Pueblo") Creek Valley[1] are thus referred to in Whipple's report:

> Five miles beyond Turkey Creek we came upon Pueblo Creek, so called on account of extensive ruins of houses and fortifications that lined its banks . . . Wide Indian trails and ruins of extensive fortifications constructed centuries since upon the heights to defend it showed that not only present tribes but ancient races had deemed Aztec Pass of great importance.

[1] The names "Turkey Creek" and "Pueblo Creek," mentioned by Whipple, do not seem to have been generally adopted by white settlers. The stream called by Whipple "Pueblo Creek" is now called Walnut Creek. "Aztec Pass" also is a name but little known to settlers in this region.

The only accounts known to the author, of the ruins in Walnut Valley are the reports of Lieutenant Whipple and Lieutenant Ives,[1] which unfortunately contain but meager descriptions of these antiquities. Most of the writers on the ruins of Arizona do not refer to those found in this valley.

Whipple speaks of several ruins on Walnut (Pueblo) Creek, but his references are too brief even for identification. One of these, said to be situated on Turkey Creek, he characterizes (op. cit , pt. 1, p. 92) as—

> dilapidated walls of a tower. The ground-plan was an ellipse, with axes 25 and 15 feet, partitions dividing it into three apartments. The walls must have been large, as they yet remained 5 feet in height, and 6 feet wide. The hill is 250 feet above the river.

This description does not correspond with respect to size, elevation, or general appearance with any ruin visited by the author in this region.

Alarcon ascended the Colorado to the point where it forms a "straight channel between high mountains," possibly the mouth of Bill Williams River, the mountains being situated, as pointed out by Professor Turner, not far from the junction of this stream with the Colorado.

Whipple found near his camp (No. 105) a ruin similar to those here mentioned, of which he wrote (p. 94) as follows:

> To obtain a still more extensive view, Mr. Campbell climbed a steep hill, several hundred feet above the ridge of the pass, formed by a short spur from the abrupt termination of the northern mountain chain, and found upon the top ruins of another fortification. Its length was 100 feet. It was 25 feet wide at one end, and 20 at the other. The wall was well built, 4 feet thick, and still remaining 5 feet high. It commanded a view of the pass, and, with proper armament, was well situated to defend and keep possession of it from an enemy. The entrance, 6 feet wide, was from the steepest side of the hill—almost inaccessible. From a fancy founded on the evident antiquity of these ruins, we have given the name of Aztec Pass to this place.

A ruin supposed to be that just described was visited by the author, the results of whose observations, however, differ so much from Whipple's account as to suggest doubt regarding the identity of the remains.

From Walnut Creek the old Indian trail followed by Whipple ascends Aztec Pass, becoming a rough wagon road bordering granitic rocks. West of the pass the country is comparatively level, sloping gradually to a sheep ranch on the Baca Grant, called Oaks and Willows. The high mountain seen from the road for some distance west of Aztec Pass is called Mount Hope (pl. 92).[2] Beyond

[1] Reports of Explorations and Surveys to Ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean. Made under the direction of the Secretary of War in 1853–4. Vol. III, parts i-iv. Extracts from the [preliminary] report of Lieut. A. W. Whipple [assisted by Lieut. J. C. Ives], Corps of Topographical Engineers, upon the route near the thirty-fifth parallel.

[2] This mountain is incorrectly located on the United States Land Office map. It stands on the Baca Grant.

VIEWS IN BIG BURRO CANYON

Oaks and Willows, keeping this mountain on the right, a fairly clear trail continues to a deserted ranch, marked by a ruined stone chimney and a corral, at the head of Burro Creek. Here, at the terminus of all wagon roads, among magnificent pines, is a pool of water; beyond, the traveler may continue on horseback to the Big Burro (pl. 94), one of the large canyons of this region.

Following Bill Williams River westward to its junction with the Colorado, no ruins on hilltops were seen by Wheeler's party, but at Yampai Spring, near the former river, the lower side of a high shelving rock forms, according to Whipple's report, a cave the walls of which are "covered" with pictographs.

The former habitations of the Walnut Creek aborigines were doubtless constructed after the manner of *jacales*, supported by stone or adobe foundations, a common feature of most of the ruins herein described. Entrance to these inclosures must have been difficult, as the doorways no doubt were guarded and many of the passages were devious, a defensive measure quite commonly adopted in the palisaded houses of the tribes bordering the Colorado River. The Indians along this river, mentioned by Don José Cortez in 1799 as the Cajuenche and the Talliguamays (Quigyuma), erect their huts in the form of an encampment, inclosing them with a stockade. According to the same author, the Cuabajai (Serranos), another tribe, built their towns ("rancherias") in the form of great squares, each provided with two gates, one at the eastern, the other at the western end; here sentinels stood. The dwellings consisted of huts constructed of limbs of trees.

A typical ruin of the Walnut Creek Valley is thus referred to by Whipple (op. cit., pt. 1, p. 93):

> Lieutenant Ives and Doctor Kennerly to-day ascended a peak 300 or 400 feet high, the last in the ridge that bounds and overlooks the valley of Pueblo [Walnut] Creek, some 3 miles below camp, and found upon the top an irregular fortification of stone, the broken walls of which were 8 or 10 feet high. Several apartments could be distinctly traced, with crumbling divisions about 5 feet thick. From thence to the pueblo, upon the gravelly slopes that lie slightly elevated above the bottom lands of the creek, there are, as has before been noted, vast quantities of pottery, and what appear to be dim traces of the foundations of adobe walls.[1] It would seem, therefore, that in ancient times there existed here a large settlement, and that the inhabitants were obliged to defend themselves by strong works against attacks from a powerful enemy.[2]

No excavation was attempted by the author in the Walnut Creek region but his attention was drawn to human bones that had been

[1] An important observation, as most of the dwellings were built on stones which formed their foundations. The adobe walls and the posts and wattling supporting them have now disappeared, the foundation stones being all that remain of the buildings.—J. W. F.

[2] The "old chief" told Alarcon of great houses of stone inhabited by a warlike race. These people were said to live near a mountain and to wear long robes sewed with needles of deer bone. Their fields of maize were small.—J. W. F.

found in the ruins on the river terrace above Mr. Ainsworth's ranch and in the neighborhood of Mr. Peter Marx's house. Although, as is commonly the case, the fragments of skeletons are locally supposed to have belonged to giants, the few bones examined by the author were of the same size and had the same general characters as those found elsewhere in the Southwest. Rings of stones indicating human burials are prominent just outside the fort above Mr. Shook's house and in the gravel of the river terrace not far from the residence of Mr. Ainsworth.

Fort below Aztec Pass

A short distance from Mr. William Johnson's ranch house on the road to Drew's ranch, on the right bank, rises a steep hill, 100 feet high, on which is situated the best-preserved fort in the Walnut Creek region. This is probably the "pueblo" mentioned by Whipple, possibly one of the structures that gave the name Pueblo Creek to the

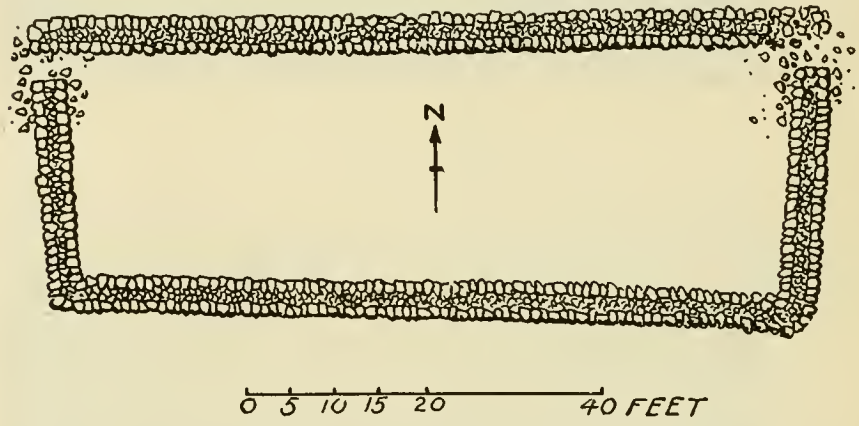


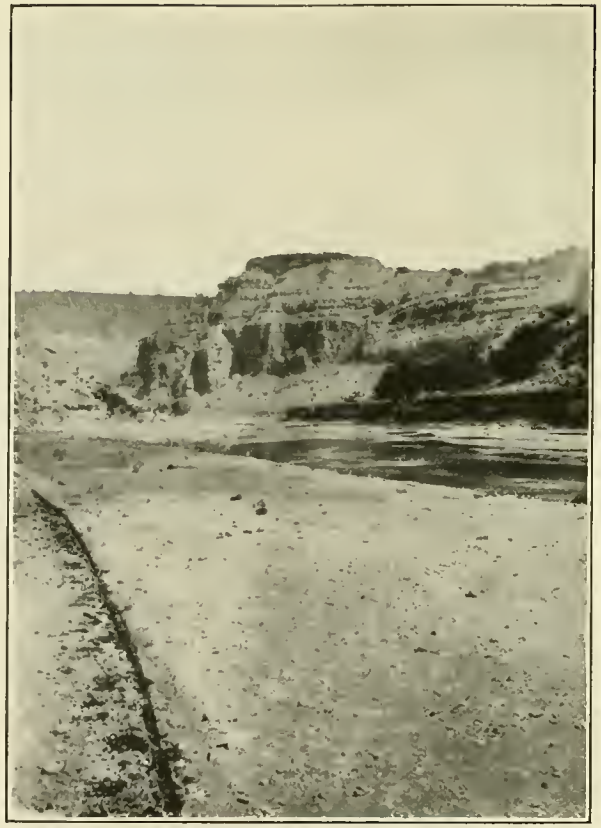
Fig. 65. Ground plan of fort below Aztec Pass.

stream now called Walnut Creek. The fort commands a view up and down the valley from Aztec Pass to the fort near Shook's ranch, and beyond.

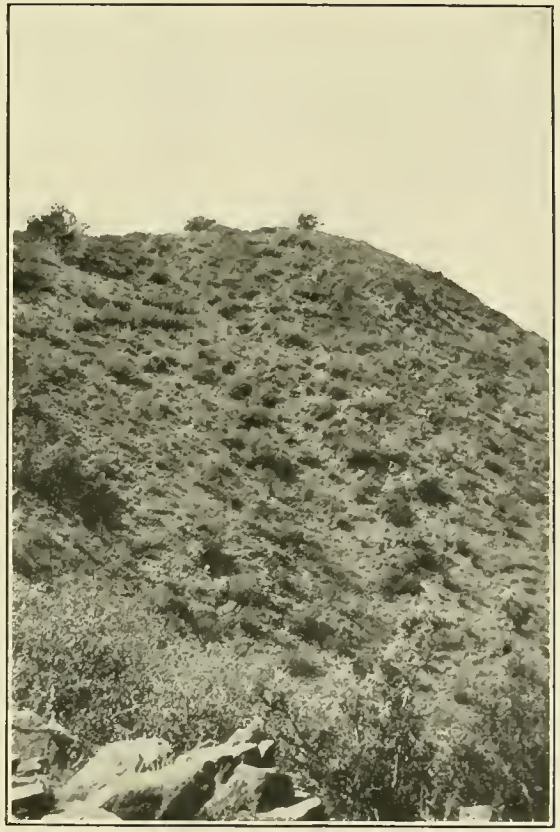
The accompanying illustrations (pls. 95–97) show the present appearance of this fort and the steepness of the hill from the side toward Walnut Creek; on account of the trees on the summit the ruin is almost invisible.

The walls are oriented east and west (fig. 65), the northern and southern sides being the longer. Although seemingly rectangular in outline, the northern side, measuring (inside) 80 feet in length, is 5 feet longer than the southern side. The eastern and western sides are respectively 30 and 25 feet in length. The average thickness of the walls is 4 feet and their height 6 feet.

At present the walls are in almost the same condition as when constructed. Except at the northeastern and northwestern corners,



NEAR THE MOUTH OF GRANITE CREEK



BELOW AZTEC PASS

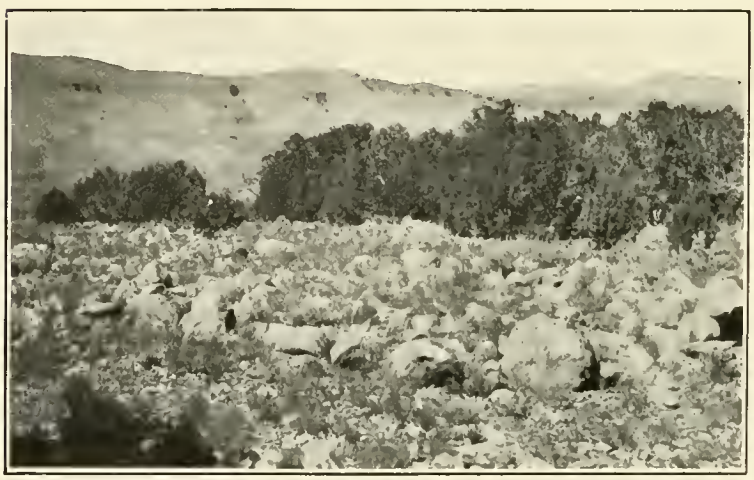
RUINS OF TWO ANCIENT FORTS

FORT BELOW AZTEC PASS

FORT BELOW AZTEC PASS

NEAR AINSWORTH'S RANCH

NEAR AINSWORTH'S RANCH

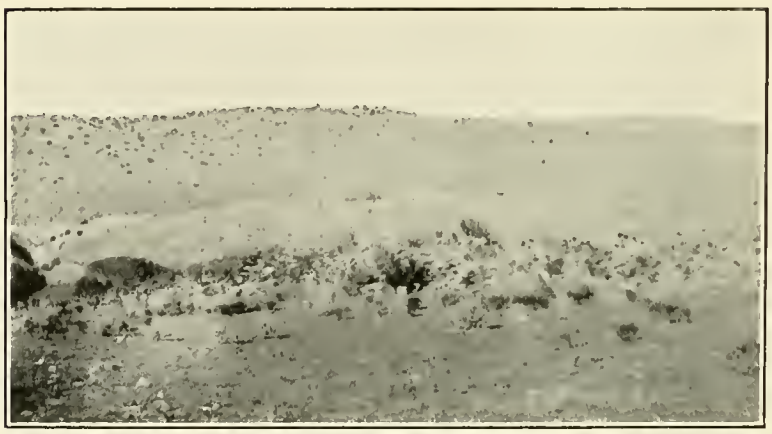


ON MARX'S RANCH

TERRACE-RUINS IN WALNUT VALLEY

FORT OVERLOOKING SHOOK'S RANCH

FORT OVERLOOKING SHOOK'S RANCH



RUIN ON MESA AT BAKER'S RANCH

WALNUT VALLEY RUINS

where the entrances to the inclosure were situated, only a few stones have fallen. All the walls are made of small rough stones laid without mortar, the largest stones for the greater part forming the foundation; the walls slant slightly inward, as is noticeable in the corner shown in plate 96 (bottom). A cross section of the broken wall reveals the fact that large stones were used in construction on the inside and the outside facings, the intermediate section being filled in with smaller stones—a common mode of mural construction in the Walnut Creek and other regions.

Ruins near Drew's Ranch House

A short distance from Mr. Drew's ranch house,[1] now (1911) deserted, are several level terraces on which are small stones arranged in squares in rows, and other evidences of former aboriginal habitations. A considerable quantity of pottery fragments is also to be found, indicating that the few level areas in this vicinity were once occupied by man. Rings of stones like those near the Ainsworth ranch house, from which fragments of human bones had been excavated, are supposed to mark the sites of burial places.

Ruins near Ainsworth's Ranch House

It may safely be said that wherever in the Walnut Creek Valley land well situated for cultivation may be found, there may be expected also evidences of occupancy by former inhabitants, either remains of houses or irrigation ditches, or pictographs. Most of these habitations are situated on the low river terraces or tongue-shaped gravelly mesas that project into the valley. The sites of the ancient farms are difficult to determine, for the reason that, as before explained, the continually changing stream has modified more or less the bottom lands along its course.

From some of the best of these ruins (pl. 98), situated near Mr. Ainsworth's house, human skeletons, fragments of pottery, and other evidences of former human occupancy have been obtained. The sites of the houses are indicated by rows of bowlders,[2] which in some places are arranged in circles.

Ruins near Shook's Ranch House

One of the largest forts in the Walnut Creek region overlooks Shook's ranch, from the summit of a lofty hill on the left bank of the creek. This fort (pl. 99), which is visible for a long distance up

[1] Drew's ranch is the last white man's home encountered on the way up the valley, before the road ascends the hill to Aztec Pass. Walnut Creek divides at a point near level areas showing evidences of cultivation. The country is well wooded, forming part of the Prescott National Forest, the ranger of which lives near old Camp Hualapai.

[2] Resembling the so-called "bowlder sites" in the middle and lower Verde Valley, described by Cosmos Mindeleff.

and down the stream, is the first of the series seen on entering Walnut Valley from Simmons post office.

This ruin (fig. 66) is nearly rectangular in shape, measuring 103 feet on the western side, 87 feet on the eastern, 118 feet on the northern, and on the southern, the side overlooking the river, 100 feet. The

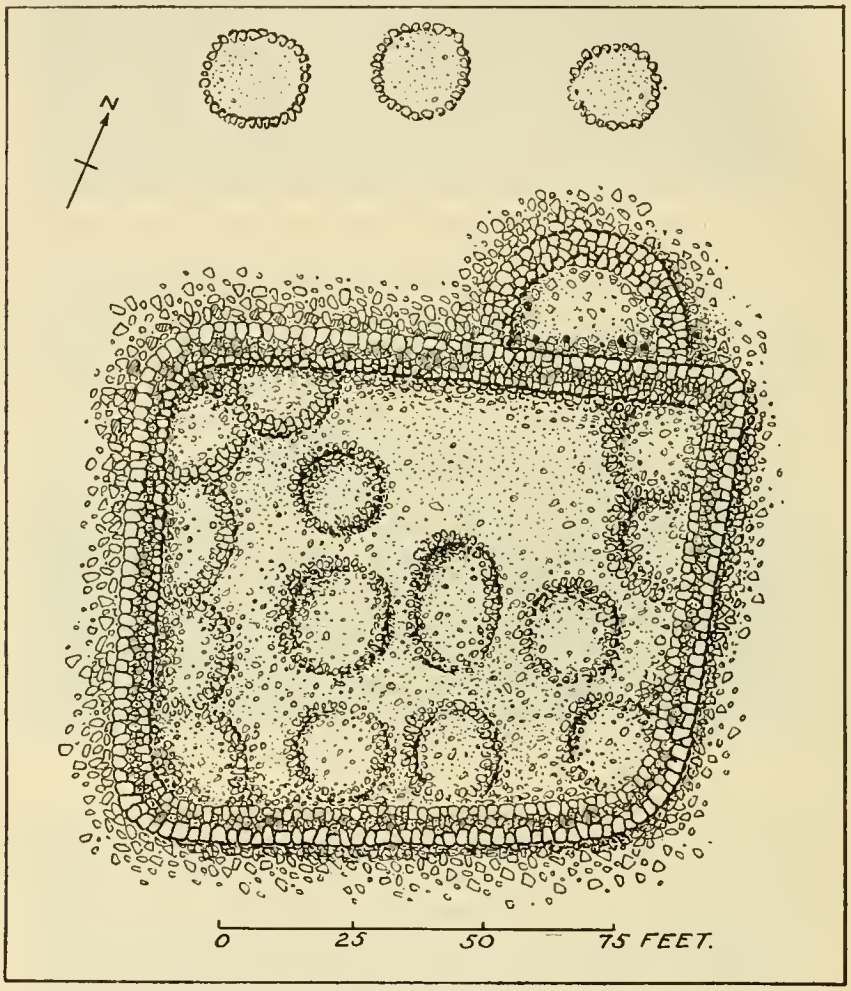


FIG. 66. Ground plan of fort overlooking Shook's ranch.

inner and outer faces of the walls are composed of large stones, the space between them being filled with rubble.

The fallen walls within the inclosure indicate the former presence of many buildings, some circular in form. Rings of stones, averaging 16 by 13 feet in diameter, are found just outside the fort, on the side facing the river, where the ground is level.

Directly across Walnut Creek from Shook's ranch house, not far from the ford and overlooking the valley, on a low, gravelly river terrace, are the remains of a quadrangular wall, oriented approximately north and south (fig. 67). The northern side of this quadrangle is 100 feet in length, the southern 93 feet, the western 125 feet, and the eastern 143 feet. The walls are composed of rows of stones, rising at no point very high above the present surface of the ground. Mr. Shook, the owner of the ranch on which this ruin is situated, informed the author that formerly this wall was higher, stones having been removed for use in the construction of buildings across the stream.

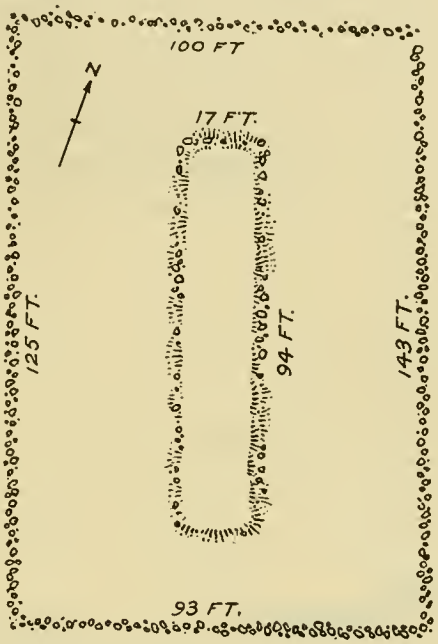


FIG. 67. Ground plan of terrace-ruin near Shook's ranch.

In the middle of this quadrangle is a low, flat-topped mound, about 4 feet in height, measuring 94 feet in length by 17 feet in width. The relation of this interior structure to the surrounding wall suggests the massive-walled building of a compound, as described in the author's account of Casa Grande, in this volume.

RUIN NEAR MARX'S RANCH HOUSE

Artificial mounds are found on terraces among the cedars on the right bank of Walnut Creek almost to its mouth. One of these mounds, opposite Mr. Peter Marx's house, is particularly interesting.

This ruin (pl. 98) consists of two parts—a rectangular inclosure, oriented north and south, and a nearly circular mound about 100 feet to the west. The former (fig. 68) measures 28 feet on the northern and 23 feet on the southern side; the eastern side is 65 feet long, and the western 63 feet. The two axes of the mound measure, respectively, 72 and 77 feet. Large ancient cedars grow on the mound and also within the rectangular inclosure.

The decorated pottery found here varies in color and design. For the greater part it consists of white ware bearing black decorations. The designs are geometrical patterns, mostly terraced figures, squares,

and parallel lines. Fragments of coiled ware, which is very rare in the Walnut Creek region, have been unearthed in these ruins. There are also many fragments of coarse, undecorated ware.

Many artificial mounds are found in the cedars on terraces on the right bank of the creek. One of these is situated on the bank of the creek opposite Mr. Marx's house.

Not far from the terrace on which these mounds are situated the course of a prehistoric irrigation ditch can be traced about 100 feet, and several distinct pictographs (pl. 101) may be seen.[1]

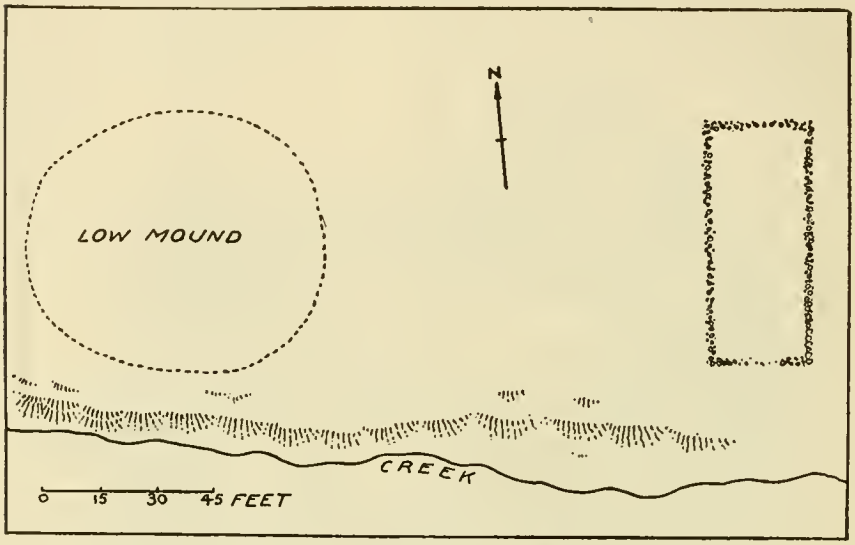


FIG. 68. Ground plan of terrace-ruin on Marx's ranch.

RUIN NEAR SHEEP CORRAL, BELOW MARX'S RANCH

About a mile and a half from the Marx ranch stands a ruin about 50 feet above the creek, on a tongue of land projecting eastward, overlooking a deep canyon on the south and a more gradual decline toward Walnut Creek on the north. The remains indicate the former presence of a block of rooms, or row of houses, 52 feet long by 17 feet wide. Four rooms with low walls, none of which was more than a single story in height, can be plainly traced.

The numerous fragments of pottery strewn over the ground outside the walls afford evidence of the occupancy of this structure for a considerable period; it served as both a post of defense and a permanent residence.

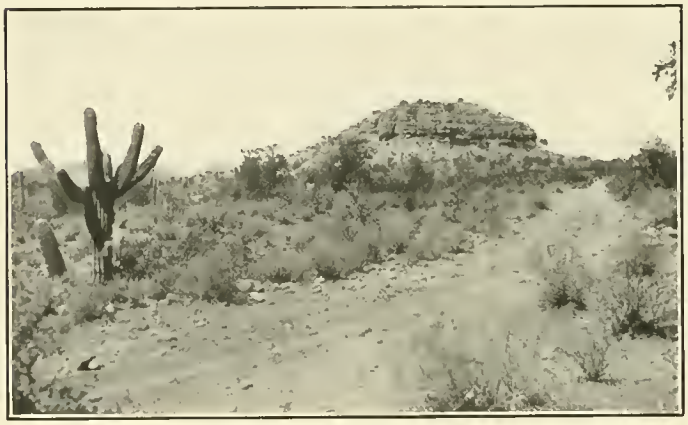
[1] The pictographs of western and southern Arizona are characteristic, differing from those made by Pueblos. In places are piles of rocks, each bearing one pictograph.

FROM THE NORTH

FROM THE SOUTH

RUIN SIX MILES BELOW MARX'S RANCH

PICTOGRAPH ON BOWLDER AT MARX'S RANCH



FORT NEAR BATRE'S RANCH

PICTOGRAPHS NEAR BATRE'S RANCH

FORT AND PICTOGRAPHS

Ruin Six Miles below Marx's Ranch

A ruined fort (pls. 85, 100) occupies a low limestone hill a short distance from the right bank of the river, where the valley widens somewhat before opening into Chino Valley. There was no running water in the stream in October, and possibly this condition exists at other times. On account of the level character of this region the fortification is visible a considerable distance from every direction.

The walls, which are more or less broken down, cover the whole top of the hill. The general ground plan of the surrounding wall is roughly oval, its longer axis extending north and south; there is an entrance at the north. The periphery of the wall measures approximately 227 feet. While a large part of the walls of rooms within the inclosure have fallen, so that they can not well be traced, a considerable section still remains, forming near the doorway what appears to have been an entrance.

The habitations dependent on this fort can be traced nearer the creek bed. On an island farther down stream are walls of another ruin.

FORT ON INDIAN HILL NEAR PRESCOTT

On the summit of a symmetrical eminence, known as Indian Hill, not far west of Prescott, is a fort similar in construction to the forts overlooking Walnut Creek. The walls are extensive and in places well preserved, but a considerable section has fallen. No fragments of pottery were found here.

In the vicinity of Thumb Butte, another eminence near Prescott, are pictographs not unlike those found in the Walnut Creek region.

Remains of other Indian structures and settlements occur at various places near Prescott; these show that the aboriginal culture of this vicinity had many points in common, if it was not identical, with that of Chino Valley and the Walnut Creek region.

Along Hassayampa and Granite Creeks and in Agua Fria and other valleys is found the same type of ruins, none of which are those of true pueblos.

FORTS NEAR FROG TANKS, AGUA FRIA RIVER

There are many forts and river-terrace ruins on the Agua Fria and other streams that head in the mountains about Prescott and flow into the Salt and the Gila. Those on the Agua Fria near Frog Tanks are typical.

About a mile up this stream, near the Batre mineral claim, where the valley widens into a level area, or bar, rises a prominent hill crowned by the remains of an old fort (pl. 101). The walls here have fallen to so great an extent that it is almost impossible to trace the ground plan of the ruin. There appears to have been a citadel,

or central building, higher than the surrounding structure, at the very top of the hill, in the midst of a level inclosure, protected by a wall, while fragments of other walls are found on the sides of the hill.

About 3 miles down the river from Frog Tanks stand several ruins still more important than that just mentioned. One of the most imposing of these is on the right of the road to Glendale, on an upheaval of rocks the tops and sides of which are surrounded by many walls of stone, as shown in plate 102. These walls are nowhere very high, but the sides of the outcrop are so steep and the walls so numerous that it is evident the place was a well-fortified stronghold.[1]

Near a ranch about a mile away are many mounds, evidently remains of houses and surrounding walls, indicating the former existence of an inclosure of stone, resembling a compound. Many specimens of stone implements, fragments of pottery, pictographs on scattered bowlders (pl. 101), and other examples of aboriginal handiwork are said to have been found in this locality. The site of these mounds is a gravelly river terrace like that of the rancherias of Walnut Creek. Each locality has a place of habitation, and a fortified place of refuge in case of attack—the two essential features of ancient aboriginal settlements in this part of Arizona.

CONCLUSIONS

Kinship of Early Inhabitants of Walnut Creek and Upper Verde Valleys

Very little is known of the kinship relations of the aborigines who inhabited the caves and erected the buildings now in ruins in the upper Verde and Walnut Creek Valleys. From traditional sources it seems probable that some of their descendants, of mixed blood, are to be looked for among the Yavapai, Walapai, and Havasupai tribes. The Hopi also claim, however, that certain of their clans once lived in the Verde Valley, and there are archeological evidences in support of this. The structures whose ruins lie to the west of the upper Verde, and those situated in the Chino, Williamson, and Walnut Creek Valleys, are probably too far west to have been the product of Hopi clans; but although their former inhabitants were not Pueblos they built dwellings similar in type to those of the latter.

According to Whipple, Ewbank, and Turner [1] (Pacific Railroad Report, vol. III, pt. 3, pp. 14–16, Washington, 1856)—

> The vast region toward the south [of San Francisco Mountains], lying between Rio Verde and the Aztec Range of mountains, is occupied by Tontos; while west and northwest of that range, to the mouth of Rio Virgen, are found a tribe calling themselves Yabipais, or, as sometimes written, Yampais. Their numbers are estimated at 2,000 each. Leroux and Savedra believe these three to be allied tribes; but there exists some doubt upon the subject. The language of the latter proves that they have

[1] The writer's attention was drawn to this ruin by Mr. Batre, who has extensive mineral claims in this neighborhood.

TRINCHERAS AT FROG TANKS RUINS

an affinity with the Mojaves and Cuchans of Rio Colorado; while, according to Don José Cortez, the Tontos belong to the Apache Nation. I have myself found Tonto villages intermingled with those of Pinal Leñas, north of Rio Gila, with whom they lived on friendly terms, with like customs and habits; except that they subsisted almost exclusively upon mescal and piñones . . . and possessed none of the fruits of agriculture. Yet the country they now occupy shows traces of ancient acequias, and has extensive valleys of great fertility . . .

The tribe that now occupies the region from Pueblo Creek to the junction of Rio Verde with the Salinas is called Tonto. The word in Spanish signifies *stupid*, but Mexicans do not apply that signification to these Indians; on the contrary, they consider them rather sharp, particularly at stealing. Therefore, as it is not a term of reproach, we may reasonably suppose that, as is frequently the case, it is the Indian name corrupted, perhaps, by Spanish spelling. . . . Don José Cortez, as may be seen in chapter vi, calls them Apaches; but Sevedra [*sic*], who is a well-informed Mexican, and, having been much among wild tribes of Indians, is generally considered authority in whatever relates to them, says that Tontos are Indians of Montezuma, like those of the pueblos of New Mexico. Pimas, Maricopas, Cuchans, and Mojaves, also, he adds, belong to the same great nation. In proof of this, he asserts that they all have one custom—that of cropping the front hair to meet their eyebrows, . . . suffering the rest, back of their ears, to grow and hang down its full length.'

In the present uncertainty as to the ancestors of the three or more tribes that inhabited the Walnut Creek region from the time the first Spaniards entered the country to the advent of the exploring parties whose reports are here quoted, it is not possible to reach a final opinion with regard to the kinship of these people. The sedentary tribes that once lived in the region have been modified, in so far as their consanguinity is concerned, by intermixture with nomadic peoples (Apache and other tribes). The archeologic evidences indicate that they had close affinity to the Mohave and Colorado River tribes and to those living about Prescott and along the northern tributaries of the Salt River. In order to estimate the value of this evidence, a few fortified hills near Prescott were visited and a preliminary examination of similar structures at the mouth of Agua Fria was made.

The ruins on the terraces along Walnut Creek are similar to those on the Verde, the "bowlder sites" of Mindeleff, who thus refers to them:[1]

It seems quite likely that only the lower course or courses of the walls of these dwellings were of bowlders, the superstructure being perhaps sometimes of earth (not adobe) but more probably often of the type known as "jacal"—upright slabs of wood plastered with mud. This method of construction was known to the ancient pueblo peoples and is used today to a considerable extent by the Mexican population of the southwest and to a less extent in some of the pueblos. No traces of this construction were found in the bowlder-marked sites, perhaps because no excavation was carried on; but it is evident that the rooms were not built of stone, and that not more than a small percentage could have been built of rammed earth or grout, as the latter, in disintegrating leaves well-defined mounds and lines of débris.

It is probable that the bowlder-marked ruins are the sites of secondary and temporary [2] structures, erected for convenience in working fields near to or overlooked by them and distant from the home pueblo. The character of the sites occupied by

[1] Mindeleff, Cosmos, Aboriginal Remains in Verde Valley, Arizona, in *13th Ann. Rep. Bur. Ethnol.*, p. 237.

[2] It seems to the author more probable that these were permanent dwellings, as viewed in the light of corresponding structures on Walnut Creek.—J. W. F.

them and the plan of the structures themselves support this hypothesis. That they were connected with the permanent stone villages is evident from their comparative abundance about each of the larger ones, and that they were constructed in a less substantial manner than the home pueblo is shown by the character of the remains.

The resemblances of forts and accompanying habitations of the upper Verde and Walnut Canyon to those about Prescott, on Granite Creek, the Hassayampa, Agua Fria, and in other valleys of northern and central Arizona, and to similar structures in the valleys of the Gila and Salt and their tributaries, have led the author to include the structures of the first-named group in a culture area which reached its most specialized development in the neighborhood of the present towns of Phoenix and Mesa City, and at Casa Grande.

It is the author's conviction that the people who built the forts and terrace habitations[1] on Agua Fria, Hassayampa, and Granite Creeks were the "frontiersmen" of those who occupied formerly the Gila and Salt River Valleys, where they constructed the great compounds, or communal buildings, like Casa Grande.

Clans of these people migrating northward met other agricultural tribes which had drifted from the Rio Grande pueblo region to the Little Colorado and its tributary, Zuñi River, and became amalgamated with them. Lower down the river they settled at Homolobi, near Winslow, which later was abandoned, some of the clans continuing northward to the Hopi mesas. These people, the ancestors of the so-called Patki clans of the modern Hopi, followed in their northern migrations the Tonto and Verde Rivers. Some of those who went up the Verde branched off to the Little Colorado, but others continued along the banks of the former stream, sending offshoots along its upper tributaries, and at last entered the Chino Valley, where they met clans moving eastward. Many northern migrants followed the Hassayampa and the Agua Fria. As these clans entered the mountain canyons, measures for protection necessitated construction of the many hilltop forts and other defenses whose remains are still found.

The general characteristics of the *trincheras* on Walnut Creek and the upper Verde suggest similar structures overlooking the valleys of the Gila and Salt. There are of course in the Walnut Creek area no large "compounds" with walls made of natural cement (*caliche*), for this region does not furnish material adapted to such construction.

The trincheras,[2] like those near Caborca and Magdalena in Sonora, or Chakyuma near Tucson, closely resemble the fortified hilltops along the Agua Fria, at Indian Hill near Prescott, and in the Chino, upper Verde, and Walnut Creek sections. Associated with these defenses are found on the terraces along the rivers in these regions rows of foundation stones, from which once rose walls of mud on a frame-

[1] There are also remains of irrigation ditches in this neighborhood.

[2] The "fort" is for the greater part a more compact structure than the *trinchera;* it is more nearly rectangular in form but the walls of the two types are practically identical in character.

work of posts and wattling, the remains of houses not unlike in construction certain former habitations at Casa Grande.[1]

In other words, the ancient people of these regions seem to have constructed two kinds of buildings—forts on the hilltops and fragile habitations on the river terraces, which differed structurally and were occupied for special and distinct purposes. The former were defensive retreats for use in case of attack, the latter permanent domiciles or habitations, conveniently situated on terraces adjacent to farms. The same or an allied people erected also houses in natural caves or excavated them in soft rock. Dwellings of the latter kind are found particularly in the area on the border of the Pueblo region, especially where the character of the rock lent itself to their construction. The inhabitants apparently had no kivas (rooms especially devoted to religious ceremonies), but they probably had a complicated ritual. Terraced ruins are rare or unknown.

It appears that the dwellings of these people belong to a special type distinct from the terraced compact community houses, or pueblos, still represented among the Hopi, the Zuñi, and the numerous Pueblos of the Rio Grande, although identical with some ancient houses in New Mexico. It is not strange if some of the descendants of clans formerly peopling this area have become amalgamated with the Hopi. In ancient times, however, the two cultures were as distinct, for instance, as are the present Havasupai and the Hopi, and in certain areas one of these cultures antedated the other. The Hopi and the Havasupai are friends and visit each other, and at times the Hopi allow some of the Havasupai to enter their kivas.

The two types of artificial caves used as domiciles have been distinguished elsewhere as those with vertical and those with lateral entrances. Both types may possess walled buildings above or in front of them, the cave becoming in the former case a storeroom, in the latter a rear chamber, possibly devoted to ceremonies.

The association of walled buildings with artificial caves is quite general, the former being found either on the talus below or on the cliff above the latter, as well shown in the cavate dwellings on Oak Creek. A similar duality in cave-dwellings occurs in the case of some of the larger cliff-houses, as, for example, those in Canyon de Chelly. This duality is parallel with that existing in the forts and rancherias or terrace (bowlder) sites on Walnut Creek.[2]

Age of Walnut Creek and Verde Valley Ruins

It does not appear from evidences presented thus far that any considerable antiquity can be ascribed to the aboriginal structures in the Walnut Creek region, which were probably in use in the middle

[1] See Prehistoric Ruins of the Gila Valley, in *Smithsonian Miscellaneous Collections*, vol. 52, pt. 4.

Massive-walled buildings for protection and fragile-walled habitations exist together within the inclosures of Gila Valley compounds, presenting the same dual combination, architecturally speaking.

of the seventeenth century. There are no extensive piles of débris in connection with most of the ruins, and the buildings are not very different from those which were inhabited in other parts of the Southwest, as in the San Pedro Valley, when Father Kino passed through it in 1610.[1] Nothing found in these ruins indicates a development of arts superior to those of the tribes that inhabited western Arizona when they first were visited by white men.

The supposition that the forts herein described were built by nomads does not rest on satisfactory evidence. Moreover, the manufacture of pottery is not an industry of wandering tribes, and the designs on fragments found in this region, although different in minor details, belong, as a whole, to a sedentary people allied to ancient Pueblos and cliff-dwellers. There seems no reason to question legends of the Walapai that their ancestors built and inhabited the now-ruined buildings scattered over the region herein treated, and were driven out by tribes with which they afterward amalgamated. It appears that the ancient inhabitants did not burn their dead, for unburned human bones have been found at several points in Walnut Valley. So far as it may be accepted as evidence, absence of cremation seems to connect them with certain modern Pueblos rather than with cliff-dwellers and with those of Yuman stock and the ancient people of the Gila, who both inhumated and burned their dead.

It is hardly possible that the former inhabitants of these valleys were completely destroyed by invaders, although it is probable that they were conquered, a condition which may have led to an admixture of Athapascan blood with a corresponding change in physical features. Their language, customs, and beliefs were similar to those of the Yuma or kindred Colorado River tribes; their buildings, pottery fragments, and other artifacts point to a sedentary rather than to a nomadic people and connect them with both the Pueblos and the inhabitants of the Colorado Valley. While the relationship with the Pueblos is apparent, it is more distant than their kinship with the ancient inhabitants of the valleys of the Gila and the Salt. A duality of building types occurs throughout the Pueblo region of New Mexico, where are found domiciliary structures like those along Walnut Creek. At times, and not without good reason, these have been interpreted as pre-Pueblo buildings, and some have gone so far as to designate them as belonging to a pre-Pueblo culture. Their likeness to the buildings of the western region is apparent, and they well may be regarded as representing a lower culture stratum. Trincheras are rare in the Pueblo region, and true pueblos (compact terraced community houses) have not yet been found west of the upper Verde, facts sufficient to divide the two regions into distinct culture areas.

[1] The pueblos on the Little Colorado west of Znñi were inhabited in the middle of the seventeenth century. In 1604 Oñate found Mohoce (the Hopi pueblos) 12 to 14 leagues west of Zuñi, and in 1632 the missionary Letrado was murdered on his way to the Cipias (Tsipiakwe), who apparently lived at the mouth of Chevlon Fork, west of Cibola (Zuñi).

PRELIMINARY REPORT ON THE LINGUISTIC CLASSIFICATION OF ALGONQUIAN TRIBES

BY

TRUMAN MICHELSON

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ILLUSTRATION

PLATE 103. Map showing the distribution and interrelation of the Algonquian dialects ..... at end

PRELIMINARY REPORT ON THE LINGUISTIC CLASSIFICATION OF ALGONQUIAN TRIBES

By Truman Michelson

INTRODUCTION

In order to determine the linguistic classification of the Algonquian tribes, the writer visited in the season of 1910 the Piegan of Montana, the Northern Cheyenne of Montana, the Northern Arapaho of Wyoming, the Menominee of Wisconsin, and the Micmac of Restigouche, P. Q., Canada. Later in the year the Ojibwa of White Earth (Minnesota) sent a delegation to Washington, and the occasion was utilized to procure a few grammatical notes from them. During the season of 1911 he visited the Fox of Iowa, and the Sauk, Kickapoo, and Shawnee of Oklahoma. In the winter of 1911–12 he spent a few weeks at the nonreservation school at Carlisle, Pa., and there had an opportunity to obtain some notes on Northern Arapaho, the Cree of Fort Totten (listed officially as Turtle Mountain Chippewa), Menominee, Sauk, Ojibwa, Ottawa, Potawatomi, and Abnaki. The results of the field work of 1911 and 1912 could be incorporated only in the proof-sheets of the present paper. For some Algonquian languages dependence has also been placed on the unpublished material of the Bureau, some manuscripts of the late Dr. William Jones (for Kickapoo) and of Mr. W. Mechling (for Malecite), and the published material. Prof. A. L. Kroeber very kindly furnished some of his Arapaho texts to supplement those of the writer. Prof. J. Dyneley Prince generously offered the use of his collection of consonantic clusters in Passamaquoddy and Abnaki. Owing to unforeseen circumstances these can not be published here, but they have been of assistance in determining the general character of Eastern Algonquian, and his helpfulness is appreciated. Thanks are due also to Dr. Robert H. Lowie, of the American Museum of Natural History, for the privilege of using some Northern Blackfoot texts. Dr. Edward Sapir, of the Geological Survey of Canada, with characteristic liberality, placed his field-notes on Cree, Montagnais, Abnaki, Malecite, and Delaware (collected in the season of 1911) at the

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writer's disposal; but they were received too late to make possible the insertion of extracts, except in the proof-sheets.

While it is too early to publish in detail the results of the writer's investigations (this applies especially to Blackfoot, Cheyenne, and Arapaho), still in view of the purely geographic classification by Mooney and Thomas in the Handbook of American Indians,[1] C. C. Uhlenbeck in *Anthropos* (III, 773–799, 1908), and F. N. Finck in his Die Sprachstämme des Erdekreises (Leipzig, 1909), a preliminary linguistic report may be acceptable.

The linguistic classification of Algonquian tribes in the present paper is based essentially on the occurrence of consonantic clusters and a few other phonetic phenomena, and on the pronominal forms of the verb.

It will be seen that the various tables introduced throughout this paper to illustrate grammatic forms are rather uneven, because in many cases the writer has not ventured to abstract the personal terminations proper from the examples given in the authorities. It will be remembered that none of the older and only a few of the recent writers take into account instrumental particles; the result (combined with inaccurate phonetics) has been that often it is too hazardous to venture an opinion as to what the form actually was. Likewise the exclusive and inclusive first persons plural are frequently not distinguished, and here the writer has had to follow his own judgment.

In conclusion, his thanks are due his colleague, Dr. John R. Swanton, for assistance in preparing the accompanying map (pl. 103).

Notes on Pronunciation

It is believed that the reader will have little trouble in understanding the symbols employed in this paper, as much the same system is employed as in the Handbook of American Indian Languages (Bulletin 40, B. A. E.). However, the following notes may prove useful.

Piegan:

$\dot{x}$ is post-palatal, approximately between German *ch* in *ich* and *ch* in *bach*.

x is post-velar.

There are no sonant stops.

Cheyenne:

$\underline{w}$ is a voiceless semivowel.

v is bilabial.

x is the surd velar spirant.

c is the surd alveolar spirant.

$\check{e}$ and $\check{o}$ (employed by R. Petter) represent whispered vowels.

Arapaho:

x is the surd velar spirant.

x^{ι} is the same, weakly articulated.

[1] *Bull. 30, Bur. Amer. Ethnol.*

tc is an intermediate with predominating surd quality, approximately between English *ch* in *church* and *j* in *judge*.

b is a pure sonant.

g is post-palatal; its sonancy is not so marked as that of *b*.

The surd stops are ordinarily unaspirated; when aspirated, the aspiration is indicated by (').

$\hat{e}$ is very open.

θ is a surd spirant articulated between the tongue and upper teeth, nearly on the flesh.

(') indicates aspiration.

$^{\varepsilon}$ indicates the glottal stop.

^{n} indicates the nasality of the vowel.

CREE (FORT TOTTEN):

$\imath$ has the sound of obscure *i*.

$\bar{c}$ is long and close.

(') indicates an aspiration; it is approximately a weak *x*; $'t$ is apt to be heard as θt.

Pure surd stops are easily distinguished, but the corresponding sonants are stronger than those of English; final *g* gives almost the impression of aspirated *k* (*k*').

CREE (RUPERT'S HOUSE: see p. 247):

ts· is alveolar, between *ts* and *tc*.

ϱ is close and short.

CREE (MOOSE):

$\bar{a}$ has the sound of long close $\bar{e}$.

MONTAGNAIS (from Doctor Sapir's notes):

ts· is palatized, between *ts* and *tc*.

$\hat{e}$ is long and very open.

MENOMINEE:

$\breve{e}$ $\breve{\imath}$ and $\breve{o}$ $\breve{u}$ are nearly indistinguishable.

g is very strong; finally it gives nearly the same impression as aspirated *k* (*k*').

FOX, SAUK, AND KICKAPOO:

For Fox, see Handbook of American Indian Languages (*Bull. 40, B. A. E.*), pt. 1, pp. 741–745.

Here it may be remarked that in all three dialects there are no true sonants; they are much stronger than in English.

$'k$, $'t$, and $'p$ among the younger people are but feebly to be distinguished from *k*, *t*, and *p*, respectively.

tc in Fox and Sauk is intermediate, nearly between *ch* in *chill* and *j* in *judge;* in Kickapoo it is a pure tenuis, approaching *ts*.

The final vowels are spoken much more faintly by the younger generation than by those advanced in years.

The writer believes Doctor Jones's *hw* is simply voiceless *w* (*ẉ*).

SHAWNEE:

Surd and sonant are difficult to distinguish.

θ is the surd interdental spirant.

$\breve{e}$ $\breve{\imath}$ and $\breve{o}$ $\breve{u}$ are extremely difficult to distinguish.

The final vowels are somewhat more easily heard than in Fox, Sauk, and Kickapoo.

tc among the older generation is pronounced as such; among the younger people it resembles more nearly *ts* in sound.

^{n} and ^{m} are consonants that are hardly sounded—merely indicated—in words by themselves; a vowel preceding renders them full sounding.

(') indicates an arrest.

OJIBWA (of Baraga):

$\acute{a}$ has the sound of $\bar{a}$.

ALGONKIN (of Lemoine):

$\hat{a}$ has the sound of $\bar{a}$.

OTTAWA:

$\bar{i}$ is long and close.

Surd and sonant (especially when final) are difficult to distinguish; final g has nearly the same sound as k'.

η is post-palatal.

DELAWARE:

n', etc. of Zeisberger indicates n followed by an obscure vowel.

ABNAKI (of Sapir):

$ɪ$ has the sound of i.

$o̧$ has the sound of close o.

$ą$ has the sound of nasalized obscure $ʌ$.

MALECITE (of Sapir):

$\hat{e}$ is long and very open.

p has the sound of p weakly articulated.

PASSAMAQUODDY:

$\hat{u}$ has the sound of *oo* in *good*.

$m̥$ is syllabic.

MICMAC:

g has the sound of velar g; apt to be heard as r.

$l̥$ and $n̥$ are syllabic.

ALGONQUIAN LINGUISTIC GROUPS

The Algonquian tribes linguistically fall into four major divisions, namely: Blackfoot, Cheyenne, Arapaho, and Eastern-Central. Each division is discussed in the following pages under the appropriate head.

Blackfoot (Siksika)

This division includes the Piegan, Bloods, and Blackfeet proper. According to Wissler,[1] the linguistic differences among the tribes are mainly in the choice of words and idioms. The same authority states that the Northern Blackfeet seem to differ more from the Piegan than the latter do from the Bloods. The present writer can describe only the language of the Piegan of Montana from personal observation. It is characterized by an abundance of harsh consonantic clusters and long consonants. The latter occur usually between vowels but may occur in clusters. The first of the following tables shows all the clusters[2] of two consonants found in one of the writer's longer texts; the second, all the clusters of three consonants in the same text:

Initial consonant	Second member of cluster						
	q	*k*	*t*	*p*	*s*	*ts*	*tc*
k					*ks*		
t							*ttc*
m					*ms*		
s		*sk*	*st*			*sts*	*stc*
ts		*tsk*		*tsp*	*tss*		
x̣		*x̣k*	*x̣t*	*x̣p*	*x̣s*		*x̣tc*
x	*xq*		*xt*	*xp*			*xtc*

[1] Social Life of the Blackfoot Indians, p. 8, New York, 1911.

[2] In this and similar tables some combinations are given which are not clusters in the strictest sense of the word, but they are introduced here for convenience and on account of their importance.

Initial consonant	2d consonant	3d consonant
k	*k*, *s*	*s*, *k*
t	*ts*, *x*	*p*, *t*, *s*
p	*s*	*k*, *s*
n	*s*	*k*
s	*k*, *t*, *s*, *ts*	*k*, *s*, *ts*, *t*, *ts*, *k*, *p*
ts	*x*	*k*
x̣	*k*	*s*
x	*q*	*t*

SUMMARY

Consonants permitted initially: *k*, *t*, *p*, *n*, *s*, *ts*, *x̣*, *x*.
Consonants permitted medially: *q*, *k*, *t*, *s*, *ts*, *x*.
Consonants permitted finally: *k*, *t*, *p*, *s*, *ts*.

It is likely that *ts* and *tc* represent a sound intermediate between these two. The following clusters also were noted in the same text: *xqtt, skks, stspss.*

The following are all the clusters of two consonants found in three texts of Northern Blackfoot taken down by Dr. Robert Lowie:

Initial consonant	Second member of cluster						
	k	*g*	*t*	*p*	*s*	*s*	*m*
q					*qs*		
k					*ks*		
p					*ps*		
s	*sk*		*st*	*sp*		*sts*	
x	*xk*	*xg*	*xt*	*xp*	*xs*	*xts*	*xm*
ts	*tsk*				*tss*		

It is clear that *xg* is due to mishearing.

The following table shows all the clusters of three consonants in the same texts:

Initial consonant	2d consonant	3d consonant
k	*s*	*k*
p	*s*	*k*, *t*, *p*
s	*k*, *ts*	*k*, *s*, *k*
ts	*ts*	*k*
x	*k*, *q*, *p*, *t*	*s*, *t*

The following cluster of four consonants occurs in the same texts: *xkst*.

It will be seen by comparing the tables of such other Algonquian languages as have numerous clusters that such a condition as obtains in Blackfoot (Piegan) is unique. So far as the writer can judge, the clusters are genuine, not pseudo. The origin of most of them is obscure.[1] Some are due to the assibilation of *t* before *i*.[2] It is likely that the cluster *sk* is original, as can be demonstrated for *st* in certain cases. For the latter, note *nestoa*[3] I (chances not to occur in the writer's texts); Cree *nista* I ALSO; and the instrumental *st* in *nitcitᴀnistāwᵃ* I SAID TO HIM (*ni—āwᵃ* I—HIM; stem *ᴀni*) is to be associated with a similar instrumental in Cree.[4]

However, the formation of the verbal compounds is typically Algonquian and most of the personal terminations of the present independent mode are patently Algonquian. The terminations in *-pinnānᵃ* (e. g., *ni—pinnānᵃ* WE [excl.]) are to be associated with Fox *-penᵃ*, Passamaquoddy *-bᴀn*. Similarly, *ki—puwāwa* YE, is to be connected with Fox and Shawnee *-pwᵃ*, Passamaquoddy *-ba*. The form *ki—āwāwᵃ* YE —HIM has an exact equivalent in Cree and Menominee. The forms *ni—āwᵃ*, *ki—āwᵃ* I—HIM, THOU—HIM, respectively, agree with Cree, Fox, Menominee, and Delaware (one form) as opposed to Ojibwa, Algonkin, Shawnee, and Eastern Algonquian.

Forms like *ki—oxpinnānᵃ* WE—THEE, YOU (not in writer's texts; based on Tims; cf. Uhlenbeck, op. cit., p. 8, bottom) certainly sug-

[1] For one or two probable sources besides those given here, see p. 232.

[2] This change has been already noted by C. C. Uhlenbeck, Original Blackfoot Texts, p. 95, Amsterdam, 1911.

[3] J. W. Tims, Grammar and Dictionary of the Blackfoot Language, London, 1889.

[4] J. Horden, Cree Grammar, p. 99, London, 1881.

gest Passamaquoddy *k—lpen*, which might be taken for *k—ulpen*, but as a matter of fact the *u* has nothing to do with the termination; owing to the phonetics of the language if a vowel following *l* is eliminated, thereby causing the *l* to become final or immediately to precede a consonant, the preceding vowel takes an *o* or a *u* tinge (see the discussion of Eastern Algonquian, p. 283). Now is it not possible that there is a similar phenomenon in Piegan and that the termination should really be given as *ki—xpinnān*^{a}, in which the *x* represents a secondary change of original *n*, as does the *l* of the Passamaquoddy form?[1] The same query would apply to certain other forms not dealt with here.

To judge from Tims, the termination for *we*(excl.)—*him* agrees in formation with Cree and Ojibwa. The agreement with the latter is no doubt purely fortuitous.

Forms like *nestoa* (Tims) 1 show agreement with Cree.

According to the writer's information some demonstrative pronouns have reference to the state of the object designated, that is, whether at rest or in motion; but some informants contradict this. It is a matter that deserves special attention.

Summing up, we may say that though Blackfoot must be classed apart from Eastern-Central Algonquian, it has the closest affinities to Fox, Eastern Algonquian, and Cree.

CHEYENNE

Cheyenne possesses consonantic clusters, though not in so great profusion as Piegan. By consulting the various tables it will be seen that some of the clusters are peculiar to the language. As is mentioned more than once in this paper, the fact that such Algonquian languages as have numerous clusters differ with respect to the types of clusters tends to show that most of these are unoriginal.

The following clusters of two consonants were noted in three of the writer's Cheyenne texts:

Initial consonant	Second member of cluster						
	k	*t*	*n*	*s*	*c*	*ts*	*v*
t	*tk*					*tts*	
n				*ns*	*nc*		
s	*sk*	*st*				*sts*	
c	*ck*	*ct*					*cv*
ts	*tsk*		*tsn*				
x	*xk*	*xt*		*xs*		*xts*	
v				*vs*	*vc*		

[1] Or it may be that the original sound is lost and that the *x* is an accretion, as *x* in *ki—ixpuwāwa* YE—ME (cf. Fox *ke—ipwa*).

The cluster *tsn* so far as noted is a pseudo-cluster, but the others, so far as the writer has been able to analyze them, are genuine. The following clusters of three consonants were noted in the same texts: *nst, xst, mst, nsts, stn,* the last being certainly a false one. The following clusters were noted as occurring finally: *sts, ns, nsts, xs, vs.* A single cluster (*st*) was observed initially, and that but once; hence it is likely an initial vowel was not heard.

The origin of the clusters that apparently are genuine is practically unknown. One case of *xp* seems merely to have developed from *p*, e. g., *woxpi* WHITE (Fox *wâpi*). The clusters *sk* and *st* are probably original (see discussion of Cree, p. 238. Unfortunately the writer has not been able to find corresponding expressions in Cree for such Cheyenne words as possess these clusters).

There are a number of words of patent Algonquian origin. Examples are: *woxpi* WHITE, *mahō'wiw*^{a} WOLF, *nic* TWO, *nive* FOUR, *mataxtu*^{a} TEN, *matama*^{a} OLD WOMAN, *nā* AND, *misi* EAT, *mi* GIVE, *āmī* MOVE.

It should be noted that under unknown conditions Central Algonquian *n* appears as *t* (compare the treatment in Cree, p. 239; but the two languages do not agree wholly in the usage); furthermore, this secondary *t*, as well as original *t*, becomes *ts* before a palatal vowel. Examples are *hitan*^{a} MAN (Fox *ineniw*^{a}), *nitanōwitatsi'm*^{a} LET US GAMBLE TOGETHER (*tsi* = Fox, etc., *tī*). Original *k* under unknown conditions appears as *n*. This, together with the other phonetic changes stated above, renders most of the forms of the independent mode intelligible. Thus, *ni—ts* I—THEE; *ni—tsemĕ* I—YOU; *ni—tsemenŏ* WE(excl.)—THEE; *ni—ĕmenŏ* THOU—US(excl.).[1] It will be noted that the structure for I—YOU, WE (excl.)—THEE agrees with Natick, Algonkin, and Peoria. The terminations for WE (excl. and incl.), intransitive, approximate the Ojibwa type. The termination for YOU (intrans.) is *ni—m*^{a} (Petter *ni—mĕ*), which phonetically approximates Algonkin, Ottawa, and Ojibwa rather than Peoria. (It may here be mentioned that Peoria, Ottawa, and Ojibwa all belong to the same division of the Central Algonquian languages.) The termination for WE(excl.)—HIM (*na—on*, Petter) has a correspondent in Natick and Eastern Algonquian. The terminations with the third person singular animate as subject are obscure. Those with the inanimate plural as objects patently are to be connected with the nominal suffix for the inanimate plural. With the assumption that original intervocalic *g* is lost, some additional forms take on a more Algonquian appearance. So violent a change is paralleled by the apparent change of *-p(ʌ)m-* to *-m-* and *-p(ʌ)t-* to *-xt-*.

[1] The last three forms are taken from Rodolphe Petter's Sketch of the Cheyenne Grammar, in *Mem. Amer. Anthr. Ass.*, I, pt. 6, 1907.

Cheyenne possesses a mode that is frequently used in narration as an indicative; it happens that but few of the forms occur in the writer's texts. The third person singular animate, intransitive, ends in *-s;* the third person plural animate, intransitive, in *-wus* (the initial sound is represented by *w* merely for convenience. The writer has been unable to determine its exact value; it is heard now as *v*, now as *w;* the only thing absolutely certain is that it is bilabial); HE—HIM is *-us;* THEY (an.)—HIM *-owus;* to distinguish third persons, the intransitive third person has an obviative *-niwus*. Assuming the phonetic change of *tc* to *s*, it will be seen that the forms resemble the Fox, Shawnee, and Peoria conjunctive. The *ni* of *-niwus* corresponds to the *ni* of Fox *-nitci*, etc.

The termination of the plural inanimate can be derived from the normal Central Algonquian termination by the phonetic laws stated above. At the same time it greatly resembles the Natick and Piegan forms, which apparently can not be derived from this source.

Summing up, we may say that although Cheyenne must be classed as a distinct major branch of Algonquian languages, yet it has close affinities with the Ojibwa division of the Eastern-Central major division; but as consonantic clusters beginning with a nasal and followed by a stop are not permitted, and the clusters *sk* and *st* occur, we must assume rather a more northern origin. If the Moiseyu really are the Monsoni, as James Mooney thinks (*Mem. Anthr. Ass.*, I, 369, 1907), there is historical support for this assumption. The fact that Natick in the ending of the termination of the present independent mode resembles the Ojibwa type probably led Petter (ibid., 447) to consider Cheyenne[1] closer to Natick. The latter does permit consonantic clusters with a nasal as the prior member and a stop as the second member, but it does not agree entirely with Ojibwa in this usage; note especially the present suppositive (subjunctive) mode. But it should be noted that the cluster *st* is not permitted, though *sk* is; and the cluster *st* is a distinct trait of Algonquian languages of northern origin (cf. Eastern Algonquian, Montagnais, Cree, Blackfoot).

ARAPAHO

This division includes Arapaho proper, Gros Ventre (Atsina), two dialects that are on the verge of extinction, and one dialect that at present is either absolutely extinct or is spoken by only very few indi-

[1] According to the writer's present information there are two Sutaio (a tribe that became incorporated with the Cheyenne) who can still speak their own language, namely, White Bull (Ice) of the Northern Cheyenne and Left Hand Bull of the Southern Cheyenne. Unfortunately the former ceased work before any texts could be secured from him, and the writer has heard only recently of the latter's ability to speak his own language. For this reason no accurate idea of the language can be given here. Cheyenne traditions are unanimous, however, in stating that the language was intelligible to the Cheyenne.

viduals. The writer can describe from personal investigation only Arapaho proper; he has been informed by members of this tribe that Gros Ventre is readily understood by them. According to Dr. A. L. Kroeber, the dialect mentioned as possibly absolutely extinct closely resembled Blackfoot; according to information received, the Piegan of Montana say a body of them joined the Arapaho and still speak their own language. This matter requires careful investigation. It is to be hoped that Doctor Kroeber will publish at an early date his comparative vocabularies of the dialects and also those phonetic laws of Arapaho proper that he has discovered and courteously communicated to the writer.

That Arapaho is an Algonquian language is shown by such words as *hīne'n* MAN, *ni^{n}se^{ɛ}e* MY ELDER BROTHER, *no^{nɛ}tâne^{ɛ}* MY DAUGHTER, *nē'sī^{i}* MY GRANDCHILD, *nīs^{i}* TWO, *nāsâ* THREE, *yē^{i}n^{i}* FOUR, *bätätAx* TEN, *bätebi* OLD WOMAN, *netä* MY HEART, *hä·sitä^{ɛa}* IT IS HOT; as well as by the system of the possessive pronouns. Some of the more radical phonetic changes that the author has observed (some of these had been anticipated by Doctor Kroeber) are *tc* becomes *θ*: *-niθ*, Fox *-nitc^{i}*; *p* becomes *θ*: *netc'* WATER, Fox *nep^{i}*, *nētc'* MY ARROW, Fox *nīp^{i}*; *k* becomes *h*: *hi-* THY, Fox *ke-*, *hâw^{a}* NOT, Ojibwa *kāwin;* *p* becomes *g(k)*: *sīsīgâ^{ɛ}* DUCK, Fox *cīcīp^{a};* *w* becomes *n*: *no^{n}ku* RABBIT, Ojibwa *wā'pōs;* *m* becomes *b* (and *w*?): *bätebi* OLD WOMAN, Fox *metemō'^{a}*, *bätätAx* TEN; *skw* becomes *x'*: *wAx'^{a}* bear, Cree *mAskwA*, Fox *ma'kw^{a}*. With the assumption that *y* becomes *n*, and *g+*, a final whispered vowel, becomes *^{ɛ}*, a number of verbal pronominal forms grow clearer in formation. (How these changes may distort words almost beyond recognition may be shown by *ni^{x}tcebgâhut'* HE RUNS BY: *ni(x)* is a common verbal prefix (?); *tceb* = Fox *pemi;* *gâhu* = Fox *-pahō-*; *-t'* the pronominal ending.) Doctor Kroeber has already remarked that in nominal forms the inanimate and animate plurals are not distinguished, though they are in verbal forms.[1] The exclusive and inclusive first person plurals are not distinguished in verbal forms, according to information received by the writer, but they certainly are in the possessive pronouns. It is thus seen that Arapaho has become very specialized. In the writer's judgment, no Algonquian language has deviated farther from the normal.

Arapaho is characterized by very weak nasal vowels, which when pronounced rapidly, however, betray scarcely any nasality. The glottal stop is extremely common. There are a number of consonantic clusters, but none of more than two consonants.

[1] See *Bulletin of the American Museum of Natural History*, vol. XVIII, p. 5, 1902.

The following table shows all the consonantic clusters found in the writer's Arapaho notes of 1912:

Initial consonant	Arapaho						
	Second member of cluster						
	k	*g*	*t*	*n*		*tc*	*s*
t				*tn*	*t*		
b		*bg*		*bn*			*bs*
s	*sk*		*st*	*sn*	*s*		
x		*xg*	*xt*	*xn*		*xtc*	

It has not been feasible to separate genuine and pseudo clusters. The *x* before *t* and *tc* is exceedingly weak. The clusters in the writer's Arapaho notes of 1910 were of the same general character but contained *θg*, *θd*, *θn*, and *vn* also. No clusters begin or end a word.

It will be seen that the clusters differ fundamentally in character from those of Piegan, Cheyenne, and Eastern Algonquian. This fact points decidedly to the clusters, with certain exceptions, in all of these languages as secondary in nature and not original.

The grammatical analysis is extremely difficult. It is clear that many secondary phonetic changes have taken place in the welded verbal compound, and so have obscured the stems. However, a sufficient number are clear enough to warrant the assertion that the general structure of Arapaho agrees essentially with the general analysis of Algonquian given by Dr. William Jones. The instrumental particles occur in the correct position. Of these the writer has been able to recognize *b* (Fox, etc., *m;* no *m* exists in Arapaho), *n*, *h*, *t*, *w*.

The personal pronouns of the independent mode (with certain apparent exceptions in the negative verb) are suffixed. Here is a very striking difference between Arapaho and normal Algonquian. The fact that the terminations are suffixed (not partially prefixed and partially suffixed) suggests that in origin they are conjunctive endings (compare Micmac), and so far as the writer has been able to find cognates at all for them (in only a decided minority of instances), it has been with the terminations of this mode. Doctor Kroeber, above cited, has noted that Cheyenne *n-* as the prefix of the second person singular, independent mode, apparently corresponds with Arapaho *-n*. This the writer considers improbable, as it would be incredible that in Arapaho a verbal pronoun that in all other Algonquian languages is prefixed, should be suffixed.

There are some formations that seem thoroughly un-Algonquian; e. g. *hêθo^{u}hok* HE, SHE TOLD HIM, HER, THEM (an.), the obviative of which is *hêθē^{i}hok*. This formation is rare; the writer has met it but a few times, always in words of the same, or approximately the same, meaning. The stem of the examples given is *hok; hê* is allied with *hêī;* so far as known at present there are no phonetic equivalents for the incorporated pronominal elements in any other Algonquian language. The prefixing of the termination for HE—HIM, HER, THEM (an.) before the initial stem is thoroughly un-Algonquian, and can not be paralleled elsewhere in these languages. The occurrence of the objective pronominal elements immediately after an initial prefix (?) is another anomaly.

To sum up, Arapaho seems to have become specialized at an early period, but it is likely that when the phonetics of the language are better understood more points in common with Eastern-Central Algonquian will become apparent; and it is possible that borrowing from a non-Algonquian stock may be shown.

Eastern-Central

Although the Eastern branch presents considerable differences from the Central branch—chiefly in the abundance of consonantic clusters—it is perfectly obvious that, compared with Blackfoot, Cheyenne, or Arapaho, it belongs intimately with the Central group. See the discussion of Eastern Algonquian (p. 280).

CENTRAL SUBTYPE

All these dialects are very intimately connected. To say that one dialect is not closely connected with another means merely that the relations between the two are not so close as between one of the dialects and a third. The lexical correspondence is very marked and the correspondence in the grammatical terminations is close. In the independent mode (or indicative mode) the correspondence is not so close as in the subjunctive. The reason for this is probably that in the latter case there is nothing to connect the personal endings with, and that in transitive forms the single pronouns (which are always suffixed) expressing both subject and object are so specialized that it is not possible readily to analyze them into their component elements, whereas the pronominal endings of the independent mode are unquestionably to be associated with the possessive pronouns and therefore vary more. (The Sauk, Fox, and Kickapoo forms in *-pena*, the Shawnee forms in *-pe*, and the Sauk, Fox, Kickapoo, and Shawnee forms in *-pwa* are wholly anomalous.) However, in the case of the independent mode, the analysis is far clearer than in

other modes. The transitive forms are based mainly on the combination of intransitive ones, sometimes part being prefixed and part suffixed, or both parts are suffixed. In certain forms it is necessary to assume certain pronominal elements which are totally unconnected with the possessive or independent pronouns, but which nevertheless reoccur in other modes than the independent.

The writer's classification of the dialects of the Central subtype is based on a study of the present independent and subjunctive modes, together with phonetic and a few other considerations.

It is possible to formulate certain subdivisions of the group. These are—

Cree-Montagnais.

Menominee.

Sauk, Fox, Kickapoo, together with Shawnee, the last-named being somewhat removed from them.

Ojibwa, Potawatomi, Ottawa, Algonkin, with Peoria somewhat removed from them.

Natick.

Delaware.

It may be further noted that Cree-Montagnais, Menominee, Sauk, Fox, Kickapoo, and Shawnee collectively form a unit as compared with any other of the subdivisions.

Cree-Montagnais

Cree

Cree is characterized by the maintenance of the clusters *sk; sp, st* (*ck, cp, ct*), which in other members of the Central group (with certain limitations noted below) are converted to *'k, 'p, 't*, respectively.[1] It is a special point of contact with Eastern Algonquian that these are likewise retained in them. Examples are Cree *amisk* (Lacombe) BEAVER, Stockbridge (Edwards) *amisque*, Ojibwa *ami'k*, Delaware *amochk*, Fox *ame'kw^a* (Shawnee *hamäkwa*, Gatschet), Peoria *amäkwa*, Abnaki *pep8n-emesk8* (Rasles) WINTER BEAVER, Micmac *pŭl-ŭmskw* BEAVER OF THIRD YEAR;[2] Cree *miskawew* HE FINDS HIM, HER, Malecite *muskuwan* HE FOUND HER, Natick *miskom* HE FINDS IT, Fox *me'kawäw^a* HE FINDS HIM, HER; Cree *iskwē·u* WOMAN, Micmac *kēsigō-ēsku^a* OLD WOMAN, Natick *squaw*, Fox *i'kwäw^a*, Ojibwa *i'kwä*, Delaware *úxkwäu* (Sapir); Cree *maskwa* BEAR, Fox *ma'kw^a*, Shawnee *^{m}kwa*, Peoria *maxkwa*, Ojibwa *ma'kwa*, Natick *mosq;* Cree *ishpimik* ABOVE, Ojibwa *ishpiming*, Menominee *icpämiya* ABOVE, Penobscot *spumki*

[1] Moreover, under unknown conditions a sibilant is retained before *k* in Fox, Ojibwa, etc., and these agree in the retention or loss of the sibilant.

[2] Rand, Dictionary of the Language of the Micmac Indians, Halifax, 1888.

HEAVEN, Abnaki *spemk*, Passamaquoddy *spemek* HIGH, Shawnee *spemegi* ABOVE (in the sky), Fox *a'pemegi*, Peoria *pämingi;* Cree *miepun* IT SNOWS, Fox *me'pu-* TO SNOW, Natick *muhpoo* IT SNOWS; Cree *mietig* WOOD, Fox *me'tegwi*, Shawnee ^{m}*tegwi*, Menominee *me^{c}tig* (probable mishearing for *me'tig*), Ojibwa *mi'tig* (Jones), *me^{z}tig* (Turtle Mountain, Michelson), Natick *mehtug*, Delaware *mehittuck*, Minsi *michtuk*.[1]

It should be noted likewise that Cree *t*(*tt*) corresponds under unknown conditions to *n* (or its phonetic correspondent) in the other Central Algonquian languages as well as in Eastern Algonquian. Thus Cree *atak* STAR, Fox *Anāgw^{a}*, Shawnee *alagwa*, Peoria *alangwa*, Ojibwa *anang*, Delaware *allanque*, Natick *anogks;* Cree *atim* DOG, Fox *Anemō'^{a}*, Natick *anum*, Delaware *allum*, Ojibwa *animosh*, Malecite *ulamus* (the last two really are diminutives).[2]

Below will be found tables for the Cree present indicative and subjunctive-participial modes.[3] The phonetic laws stated above should be kept in mind to see the correspondence with other Algonquian languages.

[1] It is gathered from Doctor Gatschet's notes on the pronunciation and his graphic fluctuation of *k*, *'k*, *xk* in the same words when corresponding to Cree *sk*, that the true value in Peoria is *'k*. By this is inferred the same regarding *p*. Examples are lacking to show the correspondent to Cree *st*, but the inference made at any rate is plausible. The writer's conclusions regarding Fox, Sauk, Kickapoo are based on Doctor Jones's and his own texts; those on Shawnee are from Doctor Gatschet's graphic variants as well as the author's own notes (but apparently there are also some secondary changes in Shawnee); those on Menominee rest on the writer's own notes; those on Ojibwa are formed mainly from a study of Doctor Jones's texts, though partly from the writer's notes; in other cases the assumption rests on analogy. The quotations from the manuscripts of the late Doctor Jones are available through the liberality of the Carnegie Institution of Washington. Most of the Ojibwa words cited in this paper are from Baraga; they are easily distinguished by lack of most diacritical marks and by the use of *sh* for *c*. Similarly, the Cree of the writer can be easily distinguished from that of Horden or Lacombe. Such words and grammatical terminations as are taken from or based on Doctor Sapir's field notes on Cree, Montagnais, Abnaki, Malecite, and Delaware, are expressly noted as such.

[2] Abnaki *wdamis* HIS DOG, Passamaquoddy *ndemis* MY DOG, both cited by Prince, are forms puzzling to the writer. See *American Anthropologist*, N. S., IV, 316, 317, 324, 684. Even so, the statement that Cree *t* can correspond to *n*, etc., of the other dialects, will stand.

[3] These are extracted from Horden (Cree Grammar, London, 1881) with the exception of the inanimate forms both as subjects and objects, which are extracted from Lacombe. The latter forms are not readily found in Horden and the table in Lacombe is highly confusing in other forms. That the forms exist in Moose Cree is shown by the texts in Horden's Grammar.

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*ne-*	*ne—nan*	*ke—nanow*	*ke-*	*ke—nowow*	*-w*	*-wuk*		*—wa*
me	—	—	—	*ke—in*	*ke—inowow*	*ne—k*	*ne—kwuk*		
us excl. . . .	—	—	—	*ke—inan*	*ke—inan*	*ne—konan*	*ne—konanuk*		
us incl. . . .	—	—	—	—	—	*ke—konow*	*ke—konowuk*		
thee	*ke—ttin*	*ke—ttinan*	—	—	—	*ke—k*	*ke—kwuk*		
you	*ke—ttinowow*	*ke—ttinan*	—	—	—	*ke—kowow*	*ke—kowowuk*		
him	*ne—ow*	*ne—anan*	*ke—ananow*	*ke—ow*	*ke—owow*	*-āō*	*-awuk*		
them an. . .	*ne—owuk*	*ne—ananuk*	*ke—anonowuk*	*ke—owuk*	*ke—owowuk*	*-āo*	*-āwuk*		
it, them inan.	*ni—en*	*ni—enân*	*ki—*{*enow* / *enanow*	*ki—en*	*ki—enâwaw*	*-am*	*-amwuk*		

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*-yan*	*-yak*	*-yuk*	*-yun*	*-yāk*	*-t*	*-tcik*	*—ki*	{*—ki* / *—kwaw*
me	—	—	—	*-eyun*	*-eyāk*	*-it*	{*-itcik* / *-itwow*		
us excl . . .	—	—	—	*-eyak*	*-eyak*	*-eyumi't*	{*-eyumi'tcik* / *-eyumi'twow*		
us incl. . . .	—	—	—	—	—	*-ttu'k*	{*-ttu'kwuk* / *-ttu'kwow*		
thee	*-ttan*	*-ttak*	—	—	—	*-sk*	{*-skik* / *-skwow*		
you	*-ttakwuk*	*-ttak*	—	—	—	*-ttak*	{*-ttakwuk* / *-ttakwow*		
him	*-uk*	*-ukit*	*-uk*	*-ut*	*-āk*	*-at*	{*-atcik* / *-atwow*		
them an. .	{*-ukik* / *-ukwow*	*-ukitcik* / *-ukitwow*	*-ukik* / *-ukwow*	*-utcik* / *-utwow*	*-ākwuk* / *-ākwow*	{*-at*	{*-atcik* / *-atwow*		
it, them, inan.	*-amân*	*-amâk*	*-amak*	*-aman*	*-amek*	*-ak*	{*-akwaw* / *-akik*		

While at Carlisle in the winter of 1911–12 the writer had an opportunity of studying for a brief period the Cree spoken at Fort Totten, North Dakota. Below are tables for the present independent mode and for what was intended (by the writer) to be the subjunctive of the same tense. Apparently there was some misunderstanding, for the forms of the latter correspond with Lacombe's "suppositif" of the "subjonctif" and Horden's future tense of the subjunctive.

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	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans.	*ni-*	*ni—nān*	*ki—nān*	*ki—nān*	*ki—nāwāwa*	*-wa*	*-wAg*		*-wA*
me	—	—	—	*ki—in*	*ki—ināwāwa*	*ni—g*	*ni—gwAg*		
us excl.	—	—	—	*ki—inān*	*ki—inān*	*mi—gunān*	*ni—gunānig*		
us incl.	—	—	—	—	—	*ki—gunān*	*ki—gunānig*		
thee	*ki—tin*	*ki—tinān*	—	—	—	*ki—g*	*ki—gwAg*		
you	*ki—tināwāwa*	*ki—tinān*	—	—	—	*ki—guwāwa*	*ki—guwāwAg*		
him	*ni—āwa*	*ni—ānān*	*ki—ānān*	*ki—āwa*	*ki—āwāwa*	*-ēu*	*-ēwAg*		
them an.	*ni—āwAg*	*ni—ānānig*	*ki—ānānig*	*ki—āwAg*	*ki—āwāwAg*	*-ēu*	*-ēwAg*		
it, them, inan.	*ni—ān*	*ni—ānān*	*ki—ānān*	*ki—ān*	*ki—ānāwāwa*	*-Am*	*-AmwAg*		

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans.	*-yāni*	*-yā'ku*	*-yA'ku*	*-yAni*	*-yēgu*	*-tci*	*-twāwi*	*-'ki*	*-'kwāwi*
me	—	—	—	*-iyAni*	*-iyēgu*	*-itci*	*-itwāwi*		
us excl.	—	—	—	*-iyā'ku*	*-iyā'ku*	*-kuyā'ku*	*-kuyā'kwāwi*		
us incl.	—	—	—	—	—	*-kuyA'ku*	*-kuyA'kwāwi*		
thee	*-tāni*	*-tā'ku*	—	—	—	*-cki*	*-ckwāwi*		
you	*-tēgu*	*-tā'ku*	—	—	—	*-kuyēgu*	*-kuyēgwāwi*		
him	*-Aki*	*-aiyā'ku*	*-aiyA'ku*	*-Atci*	*-aiyēgu*	*-ātci*	*-ātwāwi*		
them an.	*-Agwāwi*	*-aiyā'kwāwi*	*-aiyA'kwāwi*	*-Atwāwi*	*-aiyēgwāwi*	*-ātci*	*-ātwāwi*		
it, them, inan.	*-Amāni*	*-Amā'ku*	*-AmA'ku*	*-AmAni*	*-Amēgu*	*-A'ki*	*-A'kwāwi*		

We will first discuss the indicative forms. In the following Montagnais is left out, as the relations of Cree and Montagnais are treated specially below. Here it is sufficient to say that the two with phonetic differences are essentially a linguistic unit. Statistics follow:

I—YOU (pl.) no correspondent; composed of the intrans. forms for I and YOU with phonetic changes.

I—HIM agreement with F., Men., D. (one form).[1]

I—THEM an. agreement with F., Men., D. (one form).

I—IT agreement with Men., A., Oj.

I—THEM inan. agreement with Men., S.

WE (excl.) intrans. agreement with D. (one form).

WE (excl.)—THEE agreement with D. (one form).

WE (excl.)—YOU agreement with D. (one form).

WE (excl.)—HIM agreement with Oj., A., D. (one form).

WE (excl.)—THEM an. agreement with Oj., A., N.

WE (excl.)—IT agreement with A.

WE (excl.)—THEM inan. formation same as WE (excl.)—IT.

WE (incl.) intrans. (Horden) no correspondent.

WE (incl.) intrans. (Fort Totten) agreement with Oj., A.

WE (incl.) HIM (Horden); cf. Men.[2]

WE (incl.)—HIM (Fort Totten) agreement Oj., A.

WE (incl.)—THEM an. (Horden) no correspondent, cf. Men.[2]

WE (incl.)—THEM an. (Fort Totten) agreement with Oj., A.

WE (incl.)—IT (one form, Lacombe) no correspondent.

WE (incl.)—IT (one form, Lacombe; Fort Totten) agreement with A.

WE (incl.)—THEM inan. formation same as WE (incl.)—IT.

THOU—US (excl.) no correspondent; composed of THOU intrans. $+i+n\bar{a}n$: cf. Fox *ke—ipena* for the formation.

THOU—HIM agreement with Men., F., D. (one form).

THOU—THEM an. agreement with Men., F. D.

THOU—IT agreement with Men., Oj., A.

THOU—THEM inan. formation the same as THOU—IT.

YE intrans. no correspondent; same formative elements found in YE—ME.

YE—ME no correspondent; composed of the intrans. form for YE $+i$.

YE—US (excl.) no correspondent; formation precisely the same as THOU—US (excl.).

YE—HIM agreement with Men., D. (one form); cf. also Oj., A., S., N., Pass.

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[1] The following are the principal abbreviations used in this paper: A., Algonkin; an., animate; C., Cree; D., Delaware; excl., exclusive; F., Fox; inan., inanimate; incl., inclusive; M., Micmac; Men., Menominee; Mont., Montagnais; N., Natick; Oj., Ojibwa; Ot., Ottawa; P., Peoria; Pass., Passamaquoddy; Pot., Potawatomi; S., Shawnee.

[2] Lacombe gives a variant that agrees absolutely with Menominee.

YE—THEM an. agreement with Men., D. (one form); cf. also Oj. A., S., N.

YE—IT no correspondent; cf. Oj., A., S.

YE—THEM inan. formation the same as YE—IT.

HE—US (excl.) agreement with F., Oj., A., D. (one form).

HE—US (incl.; Horden) agreement with Men.

HE—US (incl.; Fort Totten) agreement with F., Oj., A. (D.?).

HE—YOU agreement with F., Men.

HE—HIM agreement with F., Men. (N.?).

HE—THEM an. agreement with F., Men.

HE—IT agreement with F., Men., P., Oj. (one form).

HE—THEM inan. agreement with F., Men., P.

THEY an.—US (excl.) agreement with F., Oj., A., N., D. (one form).

THEY an.—US (incl.; Horden) agreement with Men.

THEY an.—US (incl.; Fort Totten) agreement with F., Oj., D.

THEY an.—YOU agreement with F., Men., D.

THEY an.—HIM agreement with F., Men.

THEY an.—THEM an. agreement with F., Men.

THEY an.—IT agreement with F., Men., P.

THEY an.—THEM inan. agreement with F., Men., P.

THEY inan. no correspondent.

Common Central Algonquian agreements are naturally not included in the above statistics. Phonetic changes have caused certain terminations to resemble Ojibwa rather than Fox, e. g., HE—ME, THEE, but these are not included, as the formation is identical. The customary final *n* is not here added to the forms for I and THOU when intransitive, as it seems to be purely a phonetic product. The forms for THEY an.—ME, THEE look strange in comparison with other Algonquian languages, but in the writer's opinion a phonetic archaism is the disturbing factor.

It may be mentioned here that in the statistics given in the discussion of other Central Algonquian languages THEY inan. intrans. is not noted, as all agree (so far as material is available), as opposed to Cree. It will be seen that the greatest number of agreements is with Menominee, with Fox (Sauk and Kickapoo) second, and Delaware, Ojibwa, and Algonkin about equal, in the third place. The statistics likewise show that the unity of Cree-Montagnais, Menominee, Sauk, Fox, Kickapoo, and Shawnee mentioned on page 238 applies especially to Cree-Montagnais, Menominee, Sauk, Fox, and Kickapoo. It is due almost entirely to the very intimate relationship between Sauk, Fox, Kickapoo on the one hand and Shawnee on the other (see pp. 252, 258) that the last-mentioned language must be attached to the group. (Sauk, Fox, Kickapoo are practically one language, with slight variations (see pp. 252, 258). In the entire discussion of the

statistics throughout this paper it is understood that all are in agreement, unless the contrary is expressly stated.)

The discussion of the subjunctive-participial does not require such elaborate statistics.

The variant forms of the third person plural animate both as subject and object, ending in *-w*, are stated by Horden to be distinctive of East Main Cree, with the exception of the variants for THEY an.—HIM, THEM an. which occur elsewhere as well. The forms under discussion closely resemble the correspondents in Menominee, Algonkin, Ojibwa, and (to a lesser extent) Ottawa. (In Ojibwa THEY an.—US excl. has different formation, but has the characteristic ending.) Moreover, the respective forms of the second table of Fort Totten Cree (which is discussed below) show the same general structure. The other forms of the third person an. plural as both subject and object (except HE—THEM an., which is a true subjunctive) correspond to the Fox, Shawnee, and Ojibwa participial—not subjunctive. Even so, THEY an.—US (excl.) agrees with Fox (and approximates the Shawnee form), not Ojibwa. I—YOU agrees with Menominee, Ojibwa, and Algonkin. WE (excl.)—THEE, YOU is a true active common Central Algonquian form as opposed to the Ojibwa (and probably Potawatomi) correspondents, which are passives in structure.

Outside the above, excluding phonetic differences, as the presence of the nasal in Ojibwa (also in Delaware), the agreement between Cree, Ojibwa, and Fox in this mode is remarkable. It is a matter of great regret that hardly a single transitive form of the Peoria subjunctive or participial is found among Doctor Gatschet's papers. The terminations of the participial, subjunctive, and conjunctive modes are closely allied in Algonquian (compare the tables in the Handbook of American Indian Languages). Fortunately Doctor Gatschet has left examples of transitive forms of the Peoria conjunctive, so we can make some conjectures concerning the subjunctive. It possessed the nasal as in Ojibwa, and the forms for the third person plural animate, both as subject and object, corresponded exactly with the exception of WE incl.—THEM an., THEY an.—HIM, THEM an., to Cree. The personal terminations for WE—THEE, YOU (pl.) were the true active ones; HE—US (excl.) agreed with Fox and Cree, as also that for THEY an.—US (excl.). (For the last two cf. Shawnee, Algonkin, and Menominee.) The form for I—YOU (pl.) agreed with Ojibwa, Algonkin, and Cree. Herein we find an important point of contact with Peoria. (See, however, p. 271.) It should be noted that the Micmac conjunctive agrees partially with Peoria in having forms for the third person plural animate both as subject and object that correspond to the Fox participial, not conjunctive. We may accordingly conjecture that the Micmac subjunctive agrees partially with Cree in the same way. This together with the reten-

tion of the consonantic clusters *sk*, *sp*, *st* constitute important points of contact between Cree and Eastern Algonquian. The Natick present subjunctive approximates closely to the Fox present subjunctive and so agrees to a certain extent with Cree, but it should be noticed that practically all the forms with the third person animate, singular and plural, as subject are entirely different in structure from either the Cree or the Fox correspondents. The Delaware subjunctive shows marked peculiarities of its own and therefore presents few points of agreement with Cree, none in fact which are not shared by other Central Algonquian languages.

The discussion of the second table of Fort Totten Cree must necessarily be brief, as the sole object of its introduction is to illustrate the variant forms of East Main Cree with the third person plural as subject and object in the present subjunctive, and the correspondents in Menominee and Ojibwa. As is stated above, the table really corresponds with Horden's future tense of the subjunctive and Lacombe's "suppositif" of the "subjonctif." The forms for HE, THEY an.—US (excl. and incl.), YOU are certainly passives in formation (cf. the Ottawa correspondents of the subjunctive); but in every case Lacombe gives variants which are actives, and Horden gives these alone. Again the variants given by Lacombe for WE (excl. and incl.) —HIM, THEM an.; YE—HIM, THEM an. (which alone are given by Horden) in structure have the same formation as the correspondents of the present subjunctive. The Fort Totten Cree forms are composed of the respective intransitive subjects combined with the common objective form of the third person animate, namely *ā*, which undergoes phonetic change before the initial *y* of the suffixes (the forms given by Lacombe do not show this change). The forms of the Fort Totten Cree in which the animate objects are plural exhibit the identical formation but have the characteristic *w* suffix. (The form given in the table for YE—THEM an. is reconstructed by the writer; the form *-atwāwi*, obtained by direct questioning, is surely due to some misunderstanding, as it patently is the form for THOU—THEM an. It should be noticed that in the forms for WE (excl. and incl.)—HIM; WE (excl.)—THEE, YOU; THOU, YE—US (excl.) Lacombe's Cree terminates in *-i*, not *-u* as Fort Totten Cree does. In the forms for WE (excl. and incl.) intransitive, WE (excl. and incl.)—IT, THEM (inan.), Lacombe gives forms with both *-i* and *-u*. Horden gives only the forms with *-ā* (his transcription for long close *ę̄*) corresponding to Lacombe's *-i*. Fort Totten Cree in these personal terminations has *-u*, and this only. It should be mentioned that corresponding to Horden's *t* before *-ā* (his symbol for long close *ę̄*), the Cree of Lacombe and of Fort Totten have *tc* (*tj* in Lacombe) before *-i* throughout. Again, Horden's Cree in the form for YE

intrans. ends in *-wā*, whereas Lacombe's and Fort Totten Cree end in *-u*. It should be added that Lacombe in the forms for HE—THEM an. and THEY an.—IT, THEM inan. gives variants which resemble the corresponding subjunctive (participial) ones in structure, as well as forms which agree with the Fort Totten correspondents. It need scarce be said that neither Lacombe nor Horden distinguishes surd and sonant, nor *'k* from *k*, in his paradigms.

The formation of a preterite with a suffix *pun* in both the indicative and the subjunctive is an important point of contact with Ojibwa (see the discussion of that language, p. 269).

Another special point of contact with Peoria that should be noted is that the inanimate plural, nominative, ends in *-a;* yet notwithstanding these points of contact with Cree, Peoria (as will be shown later) belongs rather with Ojibwa.

The dialectic variations as *nīna* I, *nīra, nīya, nīθa* are well known and need no discussion. However, it should be mentioned that the so-called Cree of Rupert's House [1] is not Cree at all, but Montagnais. This the writer infers from a comparison of Doctor Sapir's notes on the Cree of Rupert's House with his notes on Montagnais, as well as with Lemoine's Dictionnaire Français-Montagnais (Boston, 1901). The following (taken from Sapir's manuscripts) will illustrate the point under consideration: *mA'skwAts'* BEARS, *nikA'mǫwats* THEY SING, ts' *inikA'mǫn'* THOU SINGEST. (See the discussion of Montagnais below.) According to Skinner (loc. cit.), the Fort George Indians speak the same dialect as those at Rupert's House.

MONTAGNAIS

As was stated above, excluding phonetic changes Montagnais is practically the same language as Cree. Some of the phonetic changes which Montagnais has suffered are: *k* (Cree *k*, Fox *k*) becomes *tsh* before *i* (Fox *e* and *ī*, Cree *e*), *tshi-* THOU (verbal), Fox *ke-*, Cree *ke-*, *tshi-* initial stem meaning completion, Fox *kī*[*ci*]-, Cree *ke-; k* (Cree *k*, Fox *g*) becomes *ts* before final *i* and *e*, even if these are lost, *-uts* (ending of animate pl. of nouns), Cree *-uk*, Fox *-Ag^{i}*, *-uts* (third person pl. animate, independent mode, intransitive), Cree *-wuk*, Fox *-wAg^{i}*, *-ts* (sign of locative singular animate), Cree *-k*, Fox *-g^{i}*, *-iats* (first person pl. excl. intransitive, subjunctive mode), Cree *-yāk*, Fox *-yāg^{e}; sk* before *i* becomes *ss;* Cree *askiy* LAND, Montagnais *assi* (Fox *a'k^{i}*); *tsh*[*i*]*t* (Fox *k*[*e*]*t*) becomes *st, stuki* THY EAR, as compared with *utuki* HIS EAR, *tshiiu* THY BODY, *kutaui* THY FATHER, *staiamiau* THOU PRAYEST, as compared with *ntaiamiau* I PRAY; *t*[*u*]*k* becomes *ts* before *e*, *-tse* (sign of the dubitative), Cree *-tokā*, Fox *-tuge; k*[*e*]*sh* becomes *tsh, tshiuelin* THOU ART HUNGRY for *ke+sh-; tc*[*i*]*k*[*i*] becomes *ts, -ats* (subj. mode; third per-

[1] Skinner, Notes on the Eastern Cree and Northern Saulteaux, p. 11, New York, 1911.

son pl. an. subj., third person sing. an. object) as compared with Cree *-atcik*, Fox (participial) *-ātcig^{i}; sk[i]k[i]* becomes *ss*, *-ss* (subj. mode, third pl. an. subj., second person sing. object), Cree *-skik*, Fox *-'kig^{i}* (part.). Further, it may be noted that final *-w^{a}*, *w^{e}* after consonants, has a history in Montagnais different from that in Cree. Observe Montagnais *ni—ku* HE—ME (independent mode), Cree *ne—k*, Fox *ne—gw^{a}*, *tshi—ku* HE—THEE (independent mode), Cree *ke—k*, Fox *ke—gwa*, *-iku* (first person pl. incl. of subjunctive), Cree *-yuk*, Fox *-yAgw^{e}*. These phonetic changes are of extremely wide application. It is unnecessary to give tables showing the verbal terminations as they agree with those of Cree. It may be noted that *-u* corresponds to Cree *-w* and *-au* to Cree *-ow*, except in the first person pl. incl., where we find *-u*. The reason for the latter is not clear.

After emphasizing the essential unity of Cree and Montagnais it may be well to point out some individual traits of the latter. In the first place though there is a *pan* (Cree *pun*) preterite, it is confined to the indicative and does not occur in the subjunctive. Another point is that the "suppositif" of the mode "subjonctif" is clearly allied to the Fox potential subjunctive for which there is no correspondent in Cree (compare Mont. *-iakukue* WE (excl.), *-ikuakue* WE (incl.), *-iekuekue* YE with Fox *-yAgāge'^{e}*, *-yAgAgu'^{a}*, *-yägägu'^{a}*, respectively). The other intransitive persons in Montagnais have the characteristic *ku* but have no correspondents in Fox. The transitive forms do not correspond closely, though there are resemblances between the two languages; hence tables are not given. In closing, it may be added that the Montagnais *on—me*, etc., has the appearance of a passive in structure, but there are several points which are not clear. (The above examples of Montagnais and Cree are taken, respectively, from Lemoine and Horden, with the exception of Cree *askiy*, which is from Lacombe. It will be seen by consulting the tables of Fort Totten Cree that the terminal *k* of Horden is doubtless the strong (impure) sonant *g* of the former, Fox, Sauk, Kickapoo, Ottawa, etc. A couple of examples of Sapir's Montagnais, *ts'inipahā'wAts* THOU KILLEST THEM an. (Fox *kenepahāwAg^{i}*), *ts'īnipahê'wAts* HE KILLED THEM an. (Fox *kīcinepahāwAg^{i}*), *ickwe'wAts* WOMEN (Fox *i'kwäwAg^{i}*), illustrate the principles mentioned above. The writer suspects that Skinner's *tcī a* (Rupert's House Cree) THOU is really *ts'īya*. The initial *ts'* at once classes the word as Montagnais. It is true that according to Lemoine the ordinary Montagnais correspondent has *l*, not *y*; but it should be noticed that in Cree dialectically *kīya* occurs (see Horden, Cree Grammar, p. 3, London, 1881; Lacombe, Dictionnaire de la Langue des Cris, p. xv, Montreal, 1874). The Rupert's House Cree then would correspond to this.)

In discussing the relations of other Eastern-Central Algonquian languages, it is understood that Montagnais agrees with Cree unless

the contrary is expressly mentioned. Hence the fact that Montagnais sometimes is not mentioned merely means that it agrees with Cree.

Menominee

Menominee is characterized by peculiar consonantic clusters due to the elimination of the final *i* of initial stems; thus, *wäpmā'wAG* THEY BEGAN TO CRY (Fox *wäpi-*), *wäpkɛtcpīpA'xtaw*^{a} HE BEGAN TO RUN SWIFTLY (Fox *wäpi-*, *kɛ'tci-*), *nikēsnäwā'wAG* I HAVE SEEN THEM (Fox *nekīcinäwāwAG*^{i}), *kätemā'wAG* THEY ARE CRYING HARD (Fox *kɛ'tcimaiyōwAG*^{i}), *kēspīw*^{a} HE HAS COME (Fox *kīcipyäw*^{a}), *kikēsmēkānēgunāwAG* THEY FOUGHT US (Fox *kekīcimīgātīhe gunānAG*^{i}). This elimination may cause a double consonant, as *pīpīmmēkātōwAG* THEY FOUGHT AS THEY WENT ALONG (Fox *pemi* + *pyämīgātīwAG*^{i}), *pīpīmmēsēw*^{a} HE WENT PAST EASING HIMSELF (Fox *pemi* + *pyämīsiw*^{a}), *wäppīpA'xtaw*^{a} HE BEGAN TO RUN (Fox *wäpi* + *pyä-*). The combination of the subordinating particle *as* with initial stems also gives rise to clusters—for example, *aspēmātisēyA* WE SHALL LIVE. The only true consonantic clusters that occur within the same morphologic division of a word are *sk* and *sp;* the latter alone is important in determining the general relations of Menominee. Examples are: *kēspin* PERHAPS, Cree *kīspin*, Ojibwa *kishpin: icpämiyA* ABOVE, Cree *ishpimik*, Ojibwa *ishpiming*, Fox *a'pemigi* (see discussion of Ojibwa, p. 261). The combination *xt* agrees with Micmac, e. g. *pīpAxtaw*^{a} HE IS COMING ON THE RUN, Micmac *pôxtAmkāsid* HE WENT ON. Surd and sonant are exceedingly difficult to distinguish; likewise *ē* and *ĕ*. The writer was unable to determine these with absolute accuracy; the sounds are given as taken down. Whispered vowels are easy to hear after *w;* in other cases it is questionable whether they actually exist. A peculiarity of Menominee is that Central Algonquian *s* under unknown conditions becomes *n:* thus *nō·nɛᵉ* MY FATHER (Fox *nōse*), *naᵉne'* MY ELDER BROTHER (Fox *nesese*), *pōninäw*^{a} HE STOPPED IN HIS FLIGHT (Fox *pōnisäw*^{a}, *-ōnä-* WALK (Fox *-usä-*).

A table of the independent mode follows.

	I	we (excl.)	we (incl.)	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*ni-*	*ni—mināwa*	*ki—mināwa*	*ki-*	*ki—mwāwa*	*-wa*	*-wAg*	*-w*[i]	*-wAn*[i]
me	—	—	—	*ki—i*	*ki—imwāwa*	*ni—g*	*ni—gug*		
us (excl.)	—	—	—	*ki—inwāwa?*	*ki—inwāwa*	*ni—gunāwa*	*ni—gunāwAg*		
us (incl.)	—	—	—	—	—	*ki—gunāwa*	*ki—gunāwAg*		
thee	*ki—n*	*ki—ninemināwa*	—	—	—	*ki—g*	*ki—gug*		
you	*ki—ninimwāwa*	*ki—ninemināwa*	—	—	—	*ki—guwāwa*	*ki—guwāwAg*		
him, her	*ni—āwa*	*ni—Anāwa*	*ki—Anāwa*	*ki—āwa*	*ki—āwāwa*	*-āwa*	*-āwAg*		
them (an.) . . .	*ni—āwAg*	*ni—AnāwAg*	*ki—AnāwAg*	*ki—āwAg*	*ki—āwāwAg*	*-āwa*	*-āwAg*		
it, them (inan.) .	*ni—An*	*ni—āmināwa*	*ki—A*[c]	*ki—An*	*ki—Amwāwa*	*-Am*	*-Amug*		

It will be seen that Menominee has many forms quite peculiar to itself, and that the agreements with Cree-Montagnais are far more numerous than with any other languages of the Central subdivision; those with Fox are next in order of number. For the agreements with Delaware, see the section on that language. Details follow:

I—YOU no correspondent; nearest N.

I—HIM agreement with C., F., D.

I—THEM an. agreement with C., F., D. (N.?).

I—IT agreement with C., A., Oj., Ot.

I—THEM inan. agreement with C.

WE (excl.) intrans. no correspondent; nearest P., Oj., A., Ot., N.

WE (excl.)—THEE no correspondent; nearest P., N.

WE (excl.)—YOU no correspondent; nearest N., A., Ot. (P.?).

WE (excl.)—HIM no correspondent; structure as WE (incl.)—HIM.

WE (excl.)—THEM an. no correspondent; cf. WE (incl.)—THEM an.

WE (excl.)—IT no correspondent.

WE (excl.)—THEM inan. no correspondent.

WE (incl.) intrans. no correspondent; nearest P., Oj.; cf. also C.

WE (incl.)—HIM; cf. C.[1]

WE (incl.)—THEM an.; cf. C.[1]

WE (incl.)—IT no correspondent.

WE (incl.)—THEM inan. no correspondent.

THOU—US (excl.) no correspondent.

THOU—HIM agreement with C., F., D.

THOU—THEM an. agreement with C., F., D.

THOU—IT agreement with C., A., Ot., Oj.

THOU—THEM inan. agreement with C.

[1] Lacombe gives a Cree variant which is the exact correspondent.

YE, intrans. no correspondent; nearest P., N.; cf. also Oj., Ot., A.; for last syllable cf. C.

YE—ME no correspondent; nearest N.; cf. also A., Oj., Ot.

YE—US (excl.) no correspondent.

YE—HIM agreement with C., D.

YE—THEM an. agreement with C., D.

YE—IT no correspondent.

YE—THEM inan. no correspondent.

HE—US (excl.) no correspondent; for the structure cf. HE—US (incl.)

HE—US (incl.) agreement with C.

HE—YOU agreement with C., F.

HE—HIM agreement with C., F. (N.?).

HE—THEM an. agreement with C., F. (N.?).

HE—IT agreement with C., F., P., N., Oj. (one form).

THEY an.—US (excl.) no correspondent; cf. THEY an.—US (incl.).

THEY an.—US (incl.) agreement with C.

THEY an.—YOU agreement with C., F., D.

THEY an.—HIM agreement with C., F.

THEY an.—THEM an. agreement with C., F.

THEY an.—IT agreement with C., F., P.

THEY an.—THEM inan. agreement with C., F., P.

Where all agree with or without phonetic changes, no record has been made. In certain cases it is impossible to be sure whether phonetic changes have not disguised agreements.

THEY inan., intrans., looks strange as contrasted with the common Central Algonquian form (on the Cree correspondent, see p. 244); however, it is merely because the word from which it is taken chances to have a vowel before the termination, and not a consonant. The same is to be observed in Kickapoo, and doubtless other dialects; thus Kickapoo *tetepyāAn^i*, i. e., *tetepyāwAn^i* (see p. 258) THEY inan. ARE ROUND (analysis: *tetepi* CIRCLE, initial stem; *-ā-* secondary connective stem, inan. copula; *-wAn^i* termination of the third person inan. pl. intrans. independent mode after a vowel as contrasted with *-ōni* after a consonant). [Note *-niwAn^i* in Fox as compared with *-ōn^i*, the ordinary termination of the third person pl. inan. intrans. independent mode; see Handbook of American Indian Languages (*Bull. 40, B. A. E.*), pt. 1, p. 833.]

It should be specially noted that Menominee, Cree, and Fox agree in having the objective forms of IT and THEM inan. expressed by a single form as opposed to Ottawa, Algonkin, Ojibwa, and Shawnee. It is a common Algonquian feature that in subordinate modes the forms are expressed by single pronouns.

A table for the subjunctive mode is not available; however, the writer can give some information concerning the relations indicated

by it. Many of the forms seem peculiar to Menominee and are difficult to analyze. I—YOU agrees with C., Oj., A., Ot., in structure and presumably also with Peoria. HE—US (excl.) has no correspondent (the form is *-iyame*), but distinctly approaches the correspondents of C., F., S., A., and presumably P. The forms of the third person plural animate both as subject and object closely resemble the correspondents in Oj., A., the East Main Cree of Horden, certain variants given by Lacombe in his Grammaire de la Langue des Cris (Montreal, 1874), and to a lesser extent the correspondents in Ottawa. The corresponding forms of Horden's future of the subjunctive, and Lacombe's "suppositif" of the "subjonctif," as well as the supposed present subjunctive of Fort Totten Cree also closely resemble them. It goes without saying that the Menominee forms lack the nasal of the Ojibwa, Algonkin, and Ottawa. On the other hand the various forms of Cree possess an extra syllable with *w*.

To sum up, we may say that although Menominee must be classed by itself, yet it is perfectly clear that it belongs intimately with Cree-Montagnais, etc., on the one hand, and with Sauk, Fox, and Kickapoo on the other.

Sauk, and Close Linguistic Cognates

The differences between Sauk, Fox, and Kickapoo consist of a trifling modification of pronunciation, vocabulary, and idiom. Shawnee is slightly removed from them. To facilitate the discussion of the relations of the last-named language to them as well as the relations of the entire group, tables for the independent, conjunctive, and subjunctive modes in Fox, and for the same modes in Shawnee, are given.

FOX INDEPENDENT MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*ne-*	*ne—pena*	*ke—pena*	*ke-*	*ke—pwa*	*-wa*	*-wAgi*	*-wi*	*-ōni*
me	—	—	—	*ke—i*	*ke—ipwa*	*ne—gwa*	*ne—gōgi*		
us excl. . . .	—	—	—	*ke—ipena*	*ke—ipena*	*ne—gunāna*	*ne—gunānAgi*		
us incl.	—	—	—	—	—	*ke—gunāna*	*ke—gunānAgi*		
thee	*ke—ne*	*ke—nepena*	—	—	—	*ke—gwa*	*ke—gōgi*		
you	*ke—nepwa*	*ke—nepena*	—	—	—	*ke—guwāwa*	*ke—guwāwAgi*		
him	*ne—āwa*	*ne—āpena*	*ke—āpena*	*ke—āwa*	*ke—āpwa*	*-äwa*	*-äwAgi*		
them an. . . .	*ne—āwAgi*	*ne—āpena*	*ke—āpena*	*ke—āwAgi*	*ke—āpwa*	*-äwa*	*-äwAgi*		
it, them, inan. .	*ne—a*	*ne—āpena*	*ke—āpena*	*ke—a*	*ke—āpwa*	*-Amwa*	*-Amōgi*		

FOX CONJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*-yāni*	*-yāge*	*-yAgwe*	*-yAni*	*-yägwe*	*-tci*	*-wātci*	*-ki*	*-'ki*
me	—	—	—	*-iyAni*	*-iyägwe*	*-itci*	*-iwātci*		
us excl. . . .	—	—	—	*-iyāge*	*-iyāge*	*-iyAmetci*	*-iyAmetci*		
us incl.	—	—	—	—	—	*-nAgwe*	*-nAgwe*		
thee	*-nāni*	*-nāge*	—	—	—	*-'ki*	*-'ki*		
you	*-nAgowe*	*-nāge*	—	—	—	*-nägwe*	*-nägwe*		
him, them, an. .	*-Agi*	*-Agetci*	*-Agwe*	*-Atci*	*-ägwe*	*-ātci*	*-äwātci*		
it, them, inan. .	*-Amāni*	*-Amāge*	*-AmAgwe*	*-AmAni*	*-Amägwe*	*-Agi*	*-Amowātci*		

FOX PRESENT SUBJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	They inan.
Intrans. . . .	*-yāne*	*-yāge*	*-yʌgwe*	*-yʌne*	*-yāgwe*	*-te*	*-wāte*	*-'ke*	*-'ke*
me	—	—	—	*-iyʌne*	*-iyāgwe*	*-ite*	*-iwāte*		
us excl. . . .	—	—	—	*-iyāge*	*-iyāge*	*-iyʌmete*	*-iyʌmete*		
us incl. . . .	—	—	—	—	—	*-nʌgwe*	*-nʌgwe*		
thee	*-nāne*	*-nāge*	—	—	—	*-'ke*	*-'ke*		
you	*-nʌgōwe*	*-nāge*		—	—	*-nāgwe*	*-nāgwe*		
him, them, an. .	*-ʌge*	*-ʌgete*	*-ʌgwe*	*-ʌte*	*-āgwe*	*-āte*	*-āwāte*		
it, them, inan. .	*-ʌmāne*	*-ʌmāge*	*-ʌmʌgwe*	*-ʌmʌne*	*-ʌmāgwe*	*-ʌge*	*-ʌmowāte*		

SHAWNEE INDEPENDENT MODE[1]

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*ni-*	*ni—pe*	*ki—pe*	*ki-*	*ki—pwa*	*-wa*	*-(wʌ)gi*	*-wi*	
me	—	—	—	*ki—i*	*ki—ipwa*	*ni—gwa*	*ni—gōgi*		
us excl. . . .	—	—	—	*ki—ipe*	*ki—pe*	*ni—guna*	*ni—gunāgi*		
us incl. . . .	—	—	—	—	—	*ki—guna*	*ki—gunāgi*		
thee	*ki lc*	*ki—lepe*	—	—	—	*ki—gwa*	*ki—gōgi*		
you	*ki—lcpwa*	*ki lcpe*	—	—	—	*ki—gōwa*	*ki—gowāgi*		
him	*ni—a*	*ni āpe*	*ki apc*	*ki a*	*ki—āwa*	*ō—āli*	*ō—āwāli*		
them an. . . .	*ni—āgi*	*ni—āpe*	*ki—āpe*	*ki—āgi*	*ki āwāgi*	*ō—ahi*	*ō—āwahi*		
it	*ni—a*	*ni āpe*	*ki—āpe*	*ki a*	*ki anāwa*	*ō a*	*ō—ānāwa*		
them inan. . .	*ni—ana*	*ni—āpe*	*ki—āpe*	*ki āna*	*ki—anāwa*	*ō—āna*	*ō anāwa*		

[1] It may be noted that the late Doctor Gatschet recorded in the independent mode *ku-* for *ō-* in the transitive forms of the third person animate, singular and plural; the writer thinks the former are probably more nearly correct; Doctor Gatschet likewise recorded *u* for o in the forms HE, THEY an.—YOU.

SHAWNEE CONJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	-yā	-yāgc	-yʌgwc	-yʌni	-yāgwc	-ici	-wātci	-gc	-gc
me	—	—	—	-iyʌni	-iyāgwc	-itci	-iwātci		
us excl. . . .	—	—	—	-iyāgc	-iyāgc	-iyʌmegitci	-iyʌmegitci		
us incl. . . .	—	—	—	—	—	-lagwc	-lagwc		
thee	-la	-lāgc	—	—	—	-'ki	-'ki		
you	-lagō	-lāgc	—	—	—	-lwāgwc	-lwāgwc		
him, them, an. .	-ʌgi	-ʌgitci	-ʌgwc	-ʌtci	-āgwc	-ātci	-āwātci		
it, them, inan. .	-ʌmā	-ʌmāgc	-ʌmʌgwc	-ʌmʌni	-ʌmāgwc	-ʌgi	-ʌmowātci		

SHAWNEE SUBJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	-yā	-yāgc	-yʌgwc	-yʌnc	-yāgwc	-itc	-wātc	-gc	-gc
me	—	—	—	-iyʌnc	-iyāgwc	-itc	-iwātc		
us excl. . . .	—	—	—	-iyāgc	-iyāgc	-iyʌmegitc	-iyʌmegitc		
us incl. . . .	—	—	—	—	—	-lʌgwc	-lʌgwc		
thee	-la	-lāgc	—	—	—	-gc	-gc		
you	-lagō	-lāgc	—	—	—	-lwāgwc	-lwāgwc		
him, them, an. .	-ʌgc	-ʌgitc	-ʌgwc	-ʌtc	-āgwc	-ātc	-āwātc		
it, them, inan. .	-ʌmā	-ʌmāgc	-ʌmʌgwc	-ʌmʌnc	-ʌmāgwc	-ʌgc	-ʌmowātc		

SHAWNEE

The forms[1] I—HIM, THEM an., THEM inan.; THOU—HIM, THEM an., THEM inan.; YE—HIM, THEM an., IT, THEM inan.; HE—YOU (pl.), HIM, THEM inan.; THEY an.—YOU (pl.), HIM, IT, THEM inan. agree with Ojibwa, etc., in structure. For the probable noteworthy agreements with Peoria, see the discussion of that language. It is quite clear that one of the Delaware dialects agrees in the formation of HE—US (excl. and incl.), THEY an.—US (excl. and incl.), even if there is but the form HE—US (excl.) in the table to support the assertion. Passamaquoddy agrees in the forms for I—YOU (pl.) HIM, THEM an.; THOU—HIM, THEM an.; YE intrans.; YE—ME, HIM; HE—US (excl. and incl.); HE—YOU (pl.), HIM; THEY an.—HIM. It is probable that the forms for HE—THEM an. and THEY an.—THEM an. are shared by Passamaquoddy (and Algonkin) but the phonetics are not certain. The forms correspond nearly to the Fox possessive pronouns for HIS (an. pl.) and THEIR (an. pl.). It is unfortunate that the inanimate forms of Passamaquoddy are not available, as they might show further agreements with Shawnee. However, it may be noted that I, THOU, YE—THEM (inan.), YE—IT agree also with Cree. Natick curiously shows apparent agreement in HE—US (incl.), and so presumably would HE—US (excl.). However, THEY an.—US (excl.) shows a different formation, and hence presumably THEY an.—US (incl.) would also. The agreement with Delaware in the form for HE—HIM may be noted in addition to the one already mentioned. (For another one, see the discussion of Delaware, p. 277.)

The forms with the termination *-pe*, though unique, are certainly to be associated with the Fox *-pena* even if the two do not entirely coincide. Those with the termination *-pwa* make it certain that Shawnee is related very intimately to Fox, etc., for no other Central Algonquian languages have the termination, though it is found (modified phonetically) in Eastern Algonquian, and an allied form occurs in Piegan. The forms for I, THOU—IT point also in this direction.

The terminations of the two subordinate modes given agree with Fox, Cree, and Micmac in lacking the nasal of Ojibwa and Peoria, and Delaware, and the terminations are to be associated with those of Fox. The *w* of the forms for HE, THEY (an.)—YOU is unique at present, otherwise the forms are normal. The forms HE, THEY an.—US (excl.) are to be associated distinctly with the Fox correspondents, though the syllable *-ge-* suggests the Ojibwa correspondents. The first person singular intransitive agrees with Delaware and Micmac. I—THEE at present is unique, but if complete schedules were available for the various Delaware dialects and for the eastern subdivision of the Eastern-Central branch, correspondents would doubtlessly be found. I—IT, THEM inan. agrees with Delaware.

[1] In giving these statistics no account is taken of such forms as are common Central Algonquian.

Phonetically Shawnee differs somewhat from Fox. The sibilant is retained in the cluster *sp*, which appears as *'p* in Fox though retained in Ojibwa (but not in Peoria): *spemegi* ON HIGH, Fox *a'pemegi* (see the discussion of Cree and Ojibwa, pp. 238, 261). The combination *-w^a* is lost after *i* and *ā*, as in Ojibwa: Shawnee *hileni* MAN, Fox *ineniw^a;* Shawnee *hugimā* CHIEF, Fox *ugimāw^a*.[1] It may be noted that *-w^a* is lost after *e* under unknown conditions when corresponding to Fox: *pemθe* (Fox *pemusäw^a*) HE WALKED ON, *piew^a* (Fox (*pyäw^a*) HE CAME. The combination *-wA-* is lost medially under unknown conditions: *pyēgi* THEY WENT (Fox *pyäwAgi*) as contrasted with *hiwaki* (Gatschet, confusion of surd and sonant; Fox *hiwAgi*) THEY SAID. The sound *s* of Fox is replaced by the interdental surd spirant and the preceding vowel is ordinarily syncopated: *nōθa* MY FATHER (Fox *nōsa*), *kōkōmθena* OUR (incl.) GRANDMOTHER (Fox *kō'komesenāna*), *nθeθa* MY ELDER BROTHER (Fox *nesesa*). Corresponding to Fox, Ojibwa, Menominee, etc., *n*, Shawnee has *l* and *n* under unknown conditions, agreeing, however, with Peoria, Delaware, and (partially) Eastern Algonquian in this use.

To sum up, we may say that while Shawnee has certain features of its own, it stands nearest to Fox, and next to Eastern Algonquian; in fact it stands nearly halfway between the two. It will be seen that Ojibwa shares but these persons of the independent mode, namely, YE—THEM an., THEY an.—YOU (pl.), which are not shared by Passamaquoddy. (No account is taken of the agreements in the inanimate objective forms, as we have no correspondents available in Passamaquoddy by which to test them.) On the other hand, Passamaquoddy shares the following forms with Shawnee which are not shared by Ojibwa: I—YOU (pl.), YE intrans., YE—ME; THEY an.—HIM. The forms for HE—US (excl. and incl.) presumably are phonetic correspondents; those for HE—THEM an. and THEY an.—THEM an. probably are equivalents. The Passamaquoddy forms for WE (excl. and incl., intrans.), WE (excl.)—THEE, YOU; THOU—US (excl.); YE—US (excl.), coinciding phonetically with the respective Fox forms, are closely similar to the corresponding Shawnee forms. Accordingly, it may be that many of the apparent points of contact with Ojibwa are due merely to the latter having certain points in common with Eastern Algonquian and Cree (this last has reference particularly to the inanimate objective forms above noted). The fact that Ojibwa in the independent mode shares only the terminations for HE—US (excl. and incl.), and THEY an.—US (excl. and incl.), with Fox as opposed to Passamaquoddy, while the latter shares numerous terminations with Fox as opposed to Ojibwa, and at

[1] It is possible that the last change may account for the differences in certain persons of the independent mode in Fox on the one hand and in Ojibwa and Shawnee on the other; but it is also possible to consider the terminations as differing in morphologic structure. The same point occurs in certain other cases.

the same time a goodly number of terminations with Ojibwa as opposed to Fox—certainly points in the same direction. For Cree (Fort Totten) likewise shares the terminations for HE—US (excl. and incl.) and THEY an.— US (excl. and incl.) with Ojibwa and Fox. Now Ojibwa shares in the independent mode no terminations with Fox as opposed to Cree, while the latter shares a number with Fox as opposed to Ojibwa (see below), at the same time having some points in common with Ojibwa as opposed to Fox (see the discussions of Cree and Ojibwa, pp. 247, 267, 268). Therefore the fact that Ojibwa shares with both Cree and Fox the terminations mentioned may be pure chance. Now if Ojibwa and Fox are only remotely connected, it is improbable on the face of it that Shawnee, which is most intimately related to Fox, should be closely connected with Ojibwa also. Consequently, there remain but few points of contact between Ojibwa and Shawnee that are certain.

SAUK, FOX, AND KICKAPOO

We have seen above that Sauk, Fox, and Kickapoo[1] differ from one another by very trifling modifications of pronunciation, vocabularies, and idioms, and that Shawnee is intimately related to them. The close connection of the Eastern Algonquian dialects is to be noted. It may be well to show that the Shawnee forms for THEY an. —US (excl. and incl.), YOU (pl.) are much closer to the Fox forms than the corresponding forms of Passamaquoddy are to the latter, even if the Shawnee forms are not absolutely identical with the Fox correspondents. On the other hand, Passamaquoddy shares absolutely with Fox the terminations in *-pena* which Shawnee only approximates. Yet Passamaquoddy shares the *ban* preterite of Ojibwa (see

[1] The first two are somewhat more closely related than either is to the third. In the discussions of the interrelations of Algonquian languages it is to be understood that Sauk and Kickapoo agree with Fox, though this is rarely mentioned.

Characteristic of Sauk is the use of the singular for the plural also in the obviative (objective) case, and in possessive pronouns of the third person (singular and plural). Thus Sauk *utʌnemāhʌni pyäniwʌni* means either HIS DOG IS COMING or HIS DOGS ARE COMING. The Fox expressions for these are, respectively, *utʌnemōhemʌni pyäniwʌni*, *utʌnemōhema'i pyäniwa'i* (by chance in the phrase Sauk *utʌnemōhʌni* lacks the *m* suffix which Fox has; but even in Sauk the writer has heard the word with the *m* suffix, though (purely by accident) not in this particular phrase). Note, too, Sauk *i'kwäwa neskinawāwa neniwʌni cemamegu änc'tʌmāgutci usīmehʌni*, which means either THE WOMAN HATED THE MAN BECAUSE HER YOUNGER BROTHER HAD BEEN SLAIN BY HIM, or THE WOMAN HATED THE MAN BECAUSE HER YOUNGER BROTHERS HAD BEEN SLAIN BY HIM, or THE WOMAN HATED THE MEN BECAUSE HER YOUNGER BROTHER HAD BEEN SLAIN BY THEM, or THE WOMAN HATED THE MEN BECAUSE HER YOUNGER BROTHERS HAD BEEN SLAIN BY THEM. In Fox such ambiguity is impossible. See sections 34, 45 of the Algonquian sketch in the Handbook of American Indian Languages (*Bulletin 40, part 1, of the Bureau of American Ethnology*). HER YOUNGER BROTHER and HER YOUNGER BROTHERS are distinguished by the respective terminations *-ʌni* and *-a'i*; the obviatives MAN and MEN would be kept apart by the identical respective suffixes; but the subordinate verb would nevertheless have the ending *-tci*.

Kickapoo agrees with Fox against Sauk in these respects, and so must be counted as nearer the former than the latter. Nevertheless in phonetics Kickapoo is further apart from them than either is from the other. In Kickapoo a special feature is a weak *w* which is either heard as full sounding, as *h*, or not at all. Doctor Jones's and the writer's texts exhibit these variations, and strangely enough agree in such variations for the greater part. An example is *ugimāwa*, *ugimāha*, *ugimāa* CHIEF (selected from Doctor Jones's texts; Sauk and Fox *ugimāwa*). In their native syllabary Kickapoo exhibit the variation of recording and not recording the *w*.

the discussion of that language, p. 269), and this feature forces us to rank it as more distant from Fox than is Shawnee. The consonantic clusters of Passamaquoddy, even if for the greater part these are secondary and due to the phonetic elimination of vowels (see the discussion of Eastern subtype, p. 283), also point in this direction.

The fact that Piegan in certain persons of the independent mode shows distinct affinities to Fox has been briefly mentioned above and is treated more fully in the discussion of Piegan (p. 231).

We have seen that Ojibwa is connected only remotely with Fox, but it may be noted that the Ojibwa subjunctive mode of the dubitative conjugation corresponds to the Fox interrogative subjunctive; but to what an extent the transitive forms agree is questionable, as these are not given by Doctor Jones.

Peoria undoubtedly belongs with the Ojibwa group of Central Algonquian languages; still there are some points of contact with Fox. It should be noted that the sibilant is not retained before *p* as in Ojibwa, e. g. Ojibwa *ishpiming*, Shawnee *spemegi*, Fox *a'pemegi*, Peoria *pämingi* ABOVE, IN THE SKY. The fact that Peoria is in certain respects phonetically more archaic than Ojibwa makes certain terminations of the indicative seem to resemble Fox rather than Ojibwa (see the section on Ojibwa, etc., pp. 267, 271); but there is one termination, namely, that for THEY an.—IT, THEM inan., in which the question of phonetics does not arise and which agrees entirely with Fox as opposed to Ojibwa.

The relation of Natick to Fox is not particularly close. In the discussion of the former language it is pointed out that most of the present suppositive mode corresponds to the Fox present subjunctive and that certain persons of the "præter" suppositive mode correspond to the Fox potential subjunctive.

From the statistics given in the discussion of Menominee it will be seen that there are no certain agreements with Fox (Sauk, Kickapoo) that are not shared also by Cree and Montagnais, while Menominee shares quite a few terminations with Cree and Montagnais which are not shared by Fox. The forms that are peculiar to these four languages, with the possible exception of Natick in the first two—the orthography is not clear—are HE—HIM, THEM an., THEY an.—HIM, THEM. The agreement of Delaware (one form) with these four dialects in the forms for I—HIM, THEM an., THOU—HIM, THEM an. is noteworthy. The fact that the inanimate plural in the objective forms of the independent mode in Cree-Montagnais, Menominee, Sauk, Fox, Kickapoo is expressed by the same forms as the inanimate singular as opposed to Ojibwa, Algonkin, Ottawa, Potawatomi, and Shawnee, is remarkable. Peoria presumably agrees with the first group.

The agreement of Ojibwa, Fox, Cree, and Montagnais in the form for THEY an.—US (incl.) of the independent mode may be noted, as also

the agreement of Fox, Ojibwa, Cree, Montagnais, and Delaware (one form) in the termination for HE—US (excl.). (Note that Fort Totten Cree agrees with Fox and Ojibwa in the forms for HE, THEY an.—US (excl. and incl.).)

Fox, Shawnee, Cree, Montagnais, and Natick lack the nasal in the present subjunctive which Ojibwa, Peoria, and Delaware have. It will be seen that Cree agrees with Fox, as opposed to Ojibwa, in the forms WE (excl.)—THEE, YOU; HE—US (excl.). Note that Algonkin agrees with Fox and Cree in the first two instances and approaches them in the last. Presumably Ottawa agrees with Algonkin in the last form as it does in the first two. Few transitive forms of the Peoria present subjunctive are available, but it is certain that Peoria is in substantial concord with Algonkin and Ottawa. The Cree forms with the third person plural as subject or object correspond to the similar Fox participial forms. In some of these forms therefore Ojibwa seems close to Fox, but most of them are entirely different in structure from both Cree and Fox. Cree and Ojibwa agree in the form for I—YOU (pl.) as opposed to Fox. The remarks made concerning Cree apply with certain limitations to Montagnais. (For these, see the discussion of that language, p. 248.) It is a matter of great regret that so few Peoria subjunctive forms are to be found among Doctor Gatschet's papers; for the Peoria conjunctive agrees in the forms for the third person plural animate as both subject and object (with the apparent exception of the forms WE (incl.)—THEM an. and THEY an.—IT, THEM inan.) with the Fox participial rather than with the Fox conjunctive, resembling Cree in the case of the present subjunctive. Now, as may be seen by reference to the Algonquian sketch in the Handbook of American Indian Languages, the terminations for the conjunctive, subjunctive, and participial are closely allied; hence it is very probable that the Peoria subjunctive is in similar agreement. (See, however, p. 271.) It is remarkable that Micmac in the conjunctive, though lacking the nasal, agrees with Peoria in that many forms in which the third person animate plural is either subject or object coincide with the Fox participial rather than with the subjunctive; but the forms for YE—THEM, HE—THEM, THEY—YOU correspond to the Fox conjunctive, not participial. The forms for HE—HIM; THEY an.—HIM, THEM an. differ in structure. (See the discussion of the Eastern subtype of Eastern-Central major division of Algonquian languages, p. 287.)

In the discussion of Montagnais it has been pointed out that the "suppositif" of the "mode subjonctif" is allied with the Fox potential subjunctive. It is repeated here to emphasize the northern affinities of Fox.

The relations of Fox to Delaware may be briefly dismissed. That Delaware shares in the independent mode the forms for I—HIM,

THEM, and THOU—HIM, THEM an. with Fox, Menominee, Montagnais, and Cree has been already pointed out as well as the agreement (one form) with Fox, Ojibwa, Cree, and Montagnais in the termination for HE—US (excl.). The concord of Delaware, Fox, Cree, and Montagnais in the ending for THEY an.—US is of importance in that it shows the northern relationships of Delaware, but a striking similarity is to be found in the fact that Delaware has a correspondent, though altered considerably phonetically, to Fox *-pena*. As noted above, this termination is found alone in Fox but has correspondents in Eastern Algonquian and Piegan, and Shawnee approximates it. The forms which have the equivalent of *-pena* in Delaware are: WE (excl., and incl.?), intransitive; WE (excl.)—THEE, YOU (pl.), HIM; THOU—US (excl.); YE—US (excl.). In all these, however, Delaware has another form as well. The forms for WE (incl.) are not given by Zeisberger, but it is reasonable to believe that they would be the same as the inclusive forms, that is where they would occur, with the substitution of *k'* for *n'*. It may be added that Delaware has a correspondent to the Fox conjunctive mode. (For other points, see the discussion of Delaware, p. 277.)

OJIBWA AND CLOSE LINGUISTIC COGNATES

The following compose this group: Ojibwa, Ottawa, Potawatomi, Algonkin, and (somewhat removed from them) Peoria, etc. A feature of the group is the accretion of a nasal. Delaware agrees with the group in this respect and this is to be considered a special point of contact with the Ojibwa group. Examples are: Fox *utci* WHENCE, Ojibwa, Peoria *ondji*, Ottawa *undji* (Gatschet), Delaware *untschi;* Fox *āneta* SOME, Cree *atit* (for the phonetics, see the discussion of Cree, p. 239), Ojibwa *anind*, Peoria *alenda*, Delaware *alinde;* Fox *anāgw*^{a} STAR, Cree *atak*, Shawnee *alagwa*, Peoria *alangwa*, Ojibwa and Algonkin *anang*, Delaware *allanque*. Other examples can be readily found by consulting the tables of verbal terminations. The formation of the negative verb by means of a suffix *ssi* (or slightly varying forms) apparently is found in no other Algonquian languages. Examples are: Ojibwa *kâwin kiwâbamigossi* HE DOES NOT SEE THEE, *kiwâbamigossig* THEY DO NOT SEE THEE; Peoria *wapamissokō* DO NOT LOOK AT ME, *kikälindansiwa* SHE DID NOT KNOW (Fox *ke'k+äne+itä-*), Ottawa *kawimshe kikikänedissiwak* (Gatschet) THEY ARE NOT YET ACQUAINTED WITH EACH OTHER (Fox *kī+ke'k+äne+tī+wag*^{i} THEY HAD KNOWN EACH OTHER). A sibilant is retained before *p* (as in Menominee and Shawnee) in Ojibwa, Ottawa, and Algonkin, though not in Peoria (the writer can give no information about Potawatomi on this point): Cree *kīcpin* (*kīspin*) IF, Ojibwa *kishpin*, Ottawa *kīcpin;* Algonkin *kicpin;* Cree *ishpimik* ABOVE, Ojibwa *ishpiming*, Peoria *pämingi*, Shawnee

spemegi, Fox *a'pemegi* (cf. Menominee *icpämiyA* OVER and ABOVE). It is pointed out in the section on Sauk, etc., that Shawnee shares the loss of *-wa* with Ojibwa after *i* and *ā*, e. g., Fox *ineniwa*, Menominee *inäniwa*, Cree (Moose) *ileliw*, Shawnee *hileni*, Ojibwa *ineni*, Ottawa *nine*, Potawatomi *nene* (Peoria *läni-a;* see below); Fox *ugimāw*^{a}, Menominee *okēmāw*^{a}, Cree *okimaw*, Shawnee *hugimā*, Ojibwa *ogima*, Algonkin *okima*, Ottawa *ûgima* (Gatschet), Peoria *kimā*. Final *wa* is lost after *e*(*ä*) in Ojibwa, Algonkin, Ottawa, and Potawatomi: Fox *i'kwäw*^{a} WOMAN (Shawnee *i''kwäw*^{a}), Cree *iskwē·u*, Ojibwa *i'kwä*, Algonkin *ikwe*, Ottawa *'kue* (Gatschet), Potawatomi *kwä* (Gatschet).

OJIBWA, POTAWATOMI, OTTAWA, AND ALGONKIN

According to Dr. William Jones, Ojibwa, Ottawa, and Potawatomi are very closely related. This opinion is confirmed by Doctor Gatschet's notes and by personal information. Doctor Jones makes the observation that Potawatomi has a tendency to slur over syllables; this also can be confirmed from Doctor Gatschet's notes and the writer's personal information (e. g., *nenwAg* MEN, Ojibwa *neniwAg*).

Following is the table for the Ojibwa independent and subjunctive modes, taken from Bishop Baraga's Grammar of the Otchipwe Language (second edition, Montreal, 1878). The second *n* of *nin* in the independent mode is the accretion spoken of above. Under certain conditions it is omitted. Presumably Algonkin agrees in the usage. (It may be noted that apparently the dialect of the Mississippi band of Ojibwa at White Earth, Minn., does not completely agree with the usage given by Baraga in his paradigms.)

The very close relationship of Algonkin may be seen from the tables showing the Algonkin present, independent, and subjunctive modes, extracted from Lemoine's Dictionnaire Français-Algonkin (Quebec, 1911).

OJIBWA PRESENT INDEPENDENT MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*nin-*	*nin—min*	*ki—min*	*ki-*	*ki—m*	(1)	*-wag*	(2)	*-on*
me	—	—	—	*ki—(i)*	*ki—im*	*nin—g*	*nin—gag*		
us excl. . . .	—	—	—	*ki—imin*	*ki—imin*	*nin—gonan*	*nin—gonanig*		
us incl. . . .	—	—	—	—	—	*ki—gonan*	*ki—gonanig*		
thee	*ki—n*	*ki—gon*	—	—	—	*ki—g*	*ki—gog*		
you	*ki—ninim*	*ki—gom*	—	—	—	*ki—gowa*	*ki—gowag*		
him	*nin—a*	*nin—anan*	*ki—anan*	*ki—a*	*ki—âwa*	*o—an*	*o—âwan*		
them an. . . .	*nin—ag*	*nin—ananig*	*ki—ananig*	*ki—ag*	*ki—âwag*	*o—an*	*o—âwan*		
it	*nin—ân*	*nin—âmin*	*ki—âmin*	*ki—an*	*ki—ânawa*	*-âm* / *o—an*	*o—ânawa*		
them inan. . .	*nin—ânan*	*nin—âmin*	*ki—âmin*	*ki—ânan*	*ki—ânawan*	*o—ânan*	*o—ânawan*		

[1] The ending proper in some cases is lost phonetically; in others it has not been recorded. Among the forms collected from the Mississippi band of Ojibwa at White Earth is *kīnibō'wa* SHE HAS DIED; the *-wa* was inaudible but was indicated by the lips. The ending *-wa*= Fox *-wa*, Cree *-w* (i. e. *wa*), etc.

[2] The termination is lost phonetically, e. g. *sanagad* IT IS DIFFICULT= Fox *sANAGAtwi* (*sANA* initial stem; *gAt* secondary connective stem; *-wi* third person singular inanimate independent mode intransitive).

OJIBWA PRESENT SUBJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans.	*-iân*	*-iâng*	*-iang*	*-ian*	*-ieg*	*-d*	*-wad*
me	—	—	—	*-iian*	*-iieg*	*-id*	*-iwad*
us excl.	—	—	—	*-iiâng*	*-iiâng*	*-iiangid*	*-iiangidwa*
us incl.	—	—	—	—	—	*-nang*	*-nangwa*
thee	*-nân*	*-goian*	—	—	—	*-k*	*-kwa*
you	*-nagog*	*-goieg*	—	—	—	*-neg*	*-negwa*
him	*-ag*	*-angid*	*-ang*	*-ad*	*-eg*	*-âd*	*-awad*
them an. . . .	*-agwa*	*-angidwa*	*-angwa*	*-adwa*	*-egwa*	*-âd*	*-awad*
it, them, inan. . .	*-âmân*	*-âmâng*	*-âmang*	*-âman*	*-âmeg*	*-âng*	*-âmowad*

ALGONKIN PRESENT INDEPENDENT MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*ni-*	*ni—min*	*ki—min*	*ki-*	*ki—m*	(lost phonetically)	*-wak*	(lost phonetically)	*-on*
me	—	—	—	*ki—*[*i;* lost phonetically]	*ki—im*	*ni—k*	*ni—gok*		
us excl. . . .	—	—	—	*ki—imin*	*ki—imin*	*ni—gonan*	*ni—gonanik*		
us incl. . . .	—	—	—	—	—	*ki—gonan*	*ki—gonanik*		
thee	*ki—n*	*ki—nimin*	—	—	—	*ki—k*	*ki—gok*		
you	*ki—nim*	*ki—nimin*	—	—	—	*ki—gowa*	*ki—gawok*		
him	*ni—a*	*ni—aaan*	*ki—anan*	*ki—a*	*ki—awa*	*o—an*	*o—awan*		
them an. . . .	*ni—ak*	*ni—anonik*	*ki—ananik*	*ki—ak*	*ki—awok*	*o—à*	*o—awà*		
it	*ni—an*	*ni—ananan*	*ki—anan*	*ki—an*	*ki—anawa*	*o—an*	*o—anawn*		
them inan. . .	*ni—anan*	*ni—anananin*	*ki—anananin*	*ki—anan*	*ki—anawan*	*o—anan*	*o—anawan*		

ALGONKIN PRESENT SUBJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.	it	they inan.
Intrans. . . .	*-iân*	*-iâng*	*-iang*	*-ian*	*-ieg*	*-tc*	*-watc*	*-k*	*-k*
me	—	—	—	*-iian*	*-iieg*	*-itc*	*-iwatc*		
us excl. . . .	—	—	—	*-iiang*	*-iiang*	*-iiamintc*	*-iamindwa*		
us incl. . . .	—	—	—	—	—	*-nang*	*-inangwa*		
thee	*-nan*	*-nang*	—	—	—	*-k*	*-kwo*		
you	*-nagok*	*-naag*	—	—	—	*-nag*	*-nagwa*		
him	*-ak*	*-ângitc*	*-ang*	*-atc*	*-eg*	*-ātc*	*-awotc*		
them an. . . .	*-akwa*	*-angitwa*	*-angwa*	*-atwa*	*-egwa*	*-ātc*	*-owatc*		
it, them, inan, .	*amân*	*amâng*	*-amang*	*-aman*	*-ameg*	*-ang*	*-omawatc*		

The independent mode will be discussed first. WE (excl.)—THEE, YOU agrees in structure with the correspondents in Ottawa, Potawatomi, Natick, and Peoria (the writer lacks a form to prove this for Peoria in the form WE (excl.)—YOU, but the inference is justifiable). They approximate the Menominee correspondents. WE (excl. and incl.)—IT agrees in structure with Ottawa and the Cree of Fort Totten; WE (excl. and incl.)—THEM inan. agrees with Ottawa (it will be remembered that in Cree the third person plural inanimate coincides with the singular). HE—THEM an., and THEY an.—THEM an. agree with Passamaquoddy in formation.

The subjunctive mode now will be taken up. WE (excl.)—THEE, YOU agree in formation with Cree, Fox, Shawnee, Natick, Delaware, and presumably also with Peoria. (The correspondent in Ottawa for WE (excl.)—YOU is not absolutely certain: see below.) The Ojibwa correspondents are passives in structure; the same may be said of the same forms of the Ojibwa independent mode. WE (excl.)—HIM, THOU—HIM, HE intrans., HE—ME, HE—US (excl.), HE—HIM, HE—THEM an., THEY an. intrans., THEY an.—ME, THEY an.—HIM, THEY an.—THEM an., THEY an.—IT, THEM inan. are conjunctives in structure and agree (with the regular phonetic differences) absolutely with the corresponding forms in Fox, and with the exception of HE—US (excl.) and THEY an.—US (excl.) (which differ slightly in structure, though exhibiting the same type of formation) also with those of Shawnee. Peoria agrees with the Algonkin forms under discussion in the terminations for WE (excl.)—HIM, THOU—HIM, HE intrans., HE—ME, HE—HIM, THEY an. intrans., THEY an.—HIM, THEY an.—IT, THEM inan. The Algonkin form for THEY an.—US (excl.), though agreeing with Ojibwa in the final syllable, nevertheless agrees with Fox (and partially with Shawnee and Cree) in morphological formation. It should be noted that the structure of HE—US (excl.) and THEY an.—US (excl.) is fundamentally the same in the corresponding forms of the Fox, Shawnee, Cree (and Peoria?) subjunctive; the Fox, Shawnee, and Peoria conjunctive; the Fox and Shawnee participial.

With the exceptions noted above, Algonkin agrees completely with Ojibwa in the present tense of the independent and subjunctive modes.

The writer's personal experience with Ottawa was confined to a few hours at Carlisle; hence but a brief description can be given. Syllables are slurred over as in Potawatomi, though probably not to so great an extent. Examples are *kwāb*ʌ*mim* YE SEE ME, *kmīnin* I GIVE THEE. Final *n* is almost inaudible; compare the suppression of final *m*, *n*, *l* in Nass (Handbook of American Indian Languages, part 1, p. 288). In some cases the writer has consistently recorded the sound as a mere aspiration, e. g. in the independent forms for WE (excl. and incl.)—HIM, HE—US (excl. and incl.). In the objective forms of

THEM inan. the writer has consistently recorded the terminal *n* as full-sounding, as also in the forms for I—IT, THOU—IT, HE—HIM, HE—THEM an., HE—IT, THEY an.—HIM, THEM an., THEY an.—IT. In the remaining cases where final *n* is to be expected in the independent mode, excepting the form for I—THEE, the writer has been inconsistent in the recording and non-recording of the sound in question. The problem is further complicated by the fact that the informant likewise spoke Ojibwa, and gave certain forms with the terminal *n* as Ojibwa and the correspondents without them (at least to the writer's ear) as Ottawa. Hence it is possible that confusion of dialect may account for the apparent inconsistency noted above. It may be mentioned that the late Doctor Gatschet's notes on Ottawa show forms without terminal *n* when etymologically expected; but the writer can not say whether the former was consistent in his usage. Another point in phonetics worth noting is that the terminal vowel in the forms I—HIM, THOU—HIM, YE—HIM is distinctly aspirated. Surd and sonant when terminal are extremely hard to distinguish. This applies especially to *d* and *t*. The writer is convinced that with the possible exception in the forms HE—THEE, IT, THEY inan., intransitive, of the subjunctive, *k* does not occur terminally, and that forms which sound as if containing this really end in strong (impure) sonant *g*. Medially surds and sonants are far easier to keep apart. Corresponding to Ojibwa and Algonkin terminal *ng* in the subjunctive the writer consistently heard a post-palatal *y* without a following stop.

Turning now to the verbal forms of the present independent and subjunctive which show the general relationship of Ottawa to other members of the group: In the independent mode the forms for WE (excl. and incl.)—IT, THEM inan.; WE (excl.)—THEE, YOU agree in formation with Algonkin as opposed to Ojibwa. (The form for WE (excl.) —THEE, YOU *k—ninim* is noteworthy for the difference in phonetics as compared with the Algonkin correspondent.) In the same mode Ottawa agrees with Ojibwa as opposed to Algonkin in the forms for HE—THEM an., THEY an.—THEM an. Distinctive of Ottawa (apparently) is the fact that the form for THEY an.—IT is the same as THEY an.—THEM inan. In the subjunctive it may be noted that the forms for WE (excl.)—HIM, THOU—HIM, HE intrans., HE—ME, HE—HIM, HE—THEM an., THEY an. intrans., THEY an.—ME, THEY an.—HIM, THEY an.—THEM an. are subjunctives (cf. Ojibwa) and not conjunctives (cf. Algonkin). The forms that the writer received for HE—US (excl.), THEY an.—US (excl. and incl.), THEY an.—THEE, THEY an.—YOU are passives in formation, probably due to some misunderstanding. The structure of WE (excl.)—THEE (and presumably WE (excl.)—YOU) agrees with Algonkin as opposed to Ojibwa. It should be noted that the form for THEY an.—IT, THEM inan., *anāwād*, apparently is absolutely unique, but the form evidently is to be associated with IT, THEM inan. in objective forms of the independent mode.

The writer's personal information on Potawatomi is too slight for him to make very definite statements concerning its precise relationship with Ojibwa, Ottawa, and Algonkin. As stated above, all are very intimately related. Potawatomi agrees with Algonkin and Ottawa in the structure of the form for WE (excl.)—THEE, YOU of the independent mode as opposed to Ojibwa. On the other hand it agrees with the latter language in the formation of WE (excl., and presumably incl.)—IT, THEM inan., of the same mode as opposed to Ottawa and Algonkin. Potawatomi possesses some marked characteristics of its own in the formation of the independent mode; WE (excl.)—HIM (*n—āmin*) and WE (incl.)—HIM (*k—āmin*) have no correspondents in any Central Algonquian language noted thus far. The forms resemble strongly the inanimate correspondents, but the instrumental *m* (not *t*) distinctly proves that they must be animate. The component elements are the respective intransitive correspondents combined with the common objective pronoun, third person animate, *ā*. The plurals of the forms under discussion must have had a similar structure. THEY an.—YOU (*k—gom*) is unquestionably a passive in formation. Apparently THEY an.—IT has the same termination as THEY an.—THEM inan.

Owing to phonetic differences, Cree, Menominee, Ojibwa, Algonkin, Ottawa, Delaware, and Passamaquoddy seem to agree in the forms for HE—ME, THEE as opposed to Sauk, Fox, Kickapoo, Shawnee, and Peoria, but Penobscot and Montagnais demonstrate that the phonetic change, though the same in the dialects mentioned, is merely a parallel development and has no significance in determining the ethnic relations of the tribes. The umlaut of Passamaquoddy in the forms demonstrates that the change in that dialect at least was a very recent one. In the same way Ojibwa *-âm* is merely the phonetic equivalent of Fox *Amw*^{a} and Peoria *-amwa*.

The Ojibwa present, of both independent and subjunctive modes will now be discussed. Bearing in mind the comments made above on Algonkin, Ottawa, and Potawatomi, this will make clear the general linguistic relations of the entire group. The special points of Peoria are considered below. It may be mentioned here that ordinarily in the statistics of linguistic agreements given throughout this paper the agreement of Algonkin, Ottawa, and Potawatomi with Ojibwa is not noted. Where the agreement of Peoria is important, the fact of the agreement is noted. We will begin with the independent mode.

As noted in the discussion of Fox, Ojibwa shares no terminations with that language which are not shared by Cree except the terminations for HE, THEY an.—US (incl.) which are allied to the forms for HE, THEY an.—US (excl.) and THEY inan. intrans. (Fort Totten Cree agrees with Ojibwa and Fox in THEY an.—US (incl.).) For

this reason we can definitely state that Ojibwa has few, if any, special points of contact with Fox. As is pointed out in the discussion of Shawnee, Ojibwa shares the following forms with that language: I—HIM, THEM an.; THOU—HIM, THEM an.; YE—HIM, THEM an.; HE—YOU (pl.), HIM; THEY an.—YOU (pl.), HIM. It will be observed that Passamaquoddy likewise shares these forms except that for YE—THEM an. It should be noted that the Shawnee forms for I, THOU, YE, HE, THEY an.—THEM inan.; YE, THEY an.—IT certainly are closely connected with the Ojibwa correspondents. It is unfortunate that the Passamaquoddy equivalents are not available. However, it should be noted that Cree agrees in general structure with Shawnee in these forms with the exception of HE, THEY an.—THEM inan., THEY an.—IT. On account of the unsatisfactory material at our disposal, it is best to abstain from a discussion of the relations of Ojibwa to Delaware regarding the independent mode here and refer the reader to the section dealing with Delaware. It will be noted that Ojibwa and Natick show some very marked agreements in the independent mode, namely, in the terminations for the first (excl., and incl.?) and second persons plural as both subject and objects. Owing to the deficient orthography, it is difficult to establish other close relations with Natick, but it is clear that in a considerable number of cases Natick differs from Ojibwa. With Cree, Ojibwa shares no forms that are not shared also by other Algonquian languages outside the Ojibwa group. (Forms are lacking to prove this for WE (incl.)—HIM, THEM an.; but the inference can be made with certainty.) The same applies to Menominee. The Menominee forms for WE (excl. and incl.), YE intrans., YE—ME approximate the Ojibwa correspondents, but it should be noted that in these cases Natick likewise resembles them. The same applies to I, WE excl.—YOU. (The form WE (incl.) intrans. is lacking, but the analogy of WE (excl.) intrans. permits us to infer the form.) The agreement of Cree and Menominee with Ojibwa in the forms of I, THOU—IT, and their approximation in the forms for YE—HIM, THEM an. should be noted; as also the approximation of the Cree form for YE—IT.

We will now proceed to discuss the subjunctive. The presence of the nasal as in Algonkin, Ottawa, Potawatomi (?), Peoria, and Delaware will be noted. But Ojibwa has little in common with the last language in this mode outside the presence of the nasal. The terminations of the third person animate, plural, as both subject and object, for the greater part are in *-wa*. It should be noted that Peoria differs most from Ojibwa in the same persons of the conjunctive and hence presumably (see below) in the subjunctive. Algonkin and Ottawa agree with Ojibwa in this formation. It is a matter of regret that a table for the Potawatomi present subjunctive is not available, as it would be of great assistance in determining the pre-

cise relations of that language to the other members of the division. A similar formation is found in Menominee and also in Cree (East Main). See the section on Menominee. Owing to phonetic changes, Ojibwa and Cree seem to agree often as opposed to Fox, Peoria, and Shawnee, but this is quite accidental. The terminations for WE (excl.)—THEE, YOU are really passives in formation; Algonkin and Ottawa represent the original type. The formation of the terminations of HE—US (excl.), THEY an.—US (excl.) is characteristic of Ojibwa, quite irrespective of the fact that the last ends in *-wa*. The forms are certainly allied to the forms for WE (excl.)—HIM, THEM an. The termination for I—YOU agrees with Cree and Peoria as opposed to Fox. Exclusive of the formations mentioned, the agreement between Ojibwa, Cree, and Fox in this mode is remarkable.

There are a few other points to be considered. Ojibwa can form a preterite in *ban*. Cree and Delaware have a correspondent and the formation of past tenses of subordinate modes by means of this suffix is an important point of contact between these languages. It is remarkable that Montagnais, though sharing the formation in the indicative, apparently lacks it in subordinate modes. Penobscot and Malecite likewise share the formation in the indicative, but the writer can not say whether they use it in the formation of past tenses of the subordinate modes. However, here we find a point of contact with Eastern Algonquian. Peoria has a similar formation but with a suffix *pa*. So far as known to the writer, its use is confined to the independent mode. Delaware possesses the same formation and it is also used to build up past tenses of subordinate modes. It is found also in Natick but seems to be confined to the independent mode. In Micmac it is attached to the conjunctive mode (which is used as an indicative) to form a past tense of the indicative; it is used in the subjunctive also, to judge from l'Abbé Maillard's Grammaire de la Langue Mikmaque (New York, 1869). On the same authority it may be added that Micmac apparently has the equivalent of the Ojibwa *ban* preterite, but only in the subjunctive, not elsewhere. These features make the Micmac forms seem so strange.

To sum up, Ojibwa chief linguistic relations are with Ottawa, Potawatomi, Algonkin, and (somewhat removed) with Peoria (see below). It has relations also with Eastern Algonquian and Cree; it is apparently but distantly related to Fox (also to Sauk and Kickapoo); it apparently has important points of contact with Shawnee, but, as stated in the discussion of that language, these, for the greater part, may be due to the fact that Shawnee has much in common with Eastern Algonquian. Ojibwa and Delaware, exclusive of the nasality and the *ban* preterite (both of which are striking), have not very much in common, but the trouble may be with our material. Ojibwa is not closely related to Menominee.

PEORIA

It was noted above that Peoria [1] certainly belongs to the Ojibwa group, as is shown by the accretion of a nasal and the formation of the negative verb. However, it possesses some strongly marked traits of its own. First of all, it has both *n* and *l* corresponding to Ojibwa, Menominee, Fox, etc., *n* under unknown conditions, and it agrees with Shawnee and Delaware in this use and to a certain extent with Eastern Algonquian. Further, a sibilant is not retained before *p* as it is in Ojibwa, e. g., *pämingi*, Ojibwa *ishpiming*, Fox *a'pemeg*[i]. Below appear the tables of the Peoria independent, conjunctive, and subjunctive modes so far as the writer has been able to construct them from Doctor Gatschet's notes and texts. The transitive forms of the independent mode are all taken from texts. Apparently Doctor Gatschet mistook the conjunctive for the independent. The confusion of surd and sonant has been left unchanged.

PEORIA INDEPENDENT MODE

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans. . .	*ni{n-, m-}*	*nin, nim}-mina*	*ki—mina*	*ki-*	*ki—mwa*	*-wa*	*-waki*
me . . .	—	—	—			*ni—kwa*	*n—koki*
us excl. . .	—	—	—			*ki—gona*	
us incl. . .	—	—	—	—	—		
thee . . .		*ki—lämina*		—	—	*ki—kwa*	
you . . .	*ki—limwa*			—	—		
him . . .	*nd—a*					*-a*	
them an. .	*ni—aki* [2]						
it, them inan.						*-amwa*	*-amōki*

PEORIA CONJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans. . .	*-yani*	*-yangi*	*-yangwi*	*-yani*	*-yikwi*	*-dji*	*-wadji*
me . . .	—	—	—	*-iyani*	*-iyikwi*	*-ita*	*-itciki*
us excl. . .	—	—	—	*-iyangi*	*-iangi*	*-iaminda*	*-iaminciki*
us incl. . .	—	—	—	—	—	*-langwa*	*-langwiki*
thee . . .	*-lani*	*-langi*	—	—	—	*-atciki*	*-'kiki*
you . . .	*-lakaki*	*-langi*	—	—	—	*-läkwa*	*-lakwiki*
him . . .	*-aki*	*-akinci*	*-angwi*	*-adji*	*-ckwi*	*-ata*	*-atciki*
them an. .	*-akiki*	*-akinciki*	*-angwi*	*-adjiki*	*-ckwi(ki?)*	*-atciki*	*-atciki*
it	*-amani*					*angi*	*amawatci*

PEORIA SUBJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans. . .	*-yanä*	*-yangiä*	*-yangwä*	*-yanä*	*-yikwä*	*-tä*	*-watä*
him . . .	*-akä*		*-angwä*	*-atä*	*-äkwä*	*-atä*	*-awata*

[1] The writer has not sufficient material to warrant dealing with the question of the exact relation of Peoria to Miami, etc., beyond stating that they all seem intimately related.

[2] Miami.

Owing to the fact that Peoria phonetically is more archaic than Ojibwa in some respects, some of the forms of the independent mode seem to resemble more closely Fox than Ojibwa (the same applies to the conjunctive mode). But passing these over, Peoria has at least these formations which have no correspondents in Ojibwa: I—YOU (pl.); WE (excl.)—THEE; THEY an.—IT, THEM inan. The first two agree with Algonkin, Ottawa, Potawatomi, and Natick, the last with Fox, Cree, and Menominee. It is a matter of regret that Doctor Gatschet made no systematic collection of indicative forms, as some of them might prove to be important in establishing the relations of Peoria. However, from the meager terminations that the writer has been able to collect, it is possible to infer with certainty the forms for I—THEE, THOU—HIM, THOU—THEM an., YE—ME, YE—HIM, YE—THEM an., HE—YOU, THEY an.—THEE, THEY an.—YOU; and these confirm us in maintaining that Peoria belongs with Ojibwa, Ottawa, Algonkin, and Potawatomi. The form for HE—US (excl.) is extremely interesting: unless there is a phenomenon similar to that in Ottawa, and unfortunately we have not sufficient material to determine this, we have a point of contact with Shawnee (which geographically would not be surprising). If the form in question is really identical with the Shawnee form, then we can infer with absolute surety that the forms for HE—US (incl.), THEY an.—US (excl. and incl.) agree with their Shawnee correspondents.

The Peoria conjunctive and subjunctive are discussed in the sections dealing with Cree and Sauk. The terminations of the conjunctive, in which the third person plural animate is subject or object, correspond to the Fox, Shawnee, and Ojibwa participial mode. Now, as in Algonquian the terminations of the conjunctive, participial, and subjunctive are very closely allied, we may infer that the Peoria subjunctive in these persons agreed with the conjunctive. It will be observed that, with the apparent exception of the terminations for HE—THEM an. and WE (incl.)—THEM an., these forms would agree (as do those of the conjunctive) with the Cree subjunctive. (In reading Doctor Gatschet's texts the writer has met with *-atci* and *-awatci*, the terminations for HE—HIM, THEM an., THEY an.—HIM, THEM an., respectively. These are true conjunctive forms. The question hence arises to what an extent his notes giving the forms in the table should be accepted. The true conjunctive forms agree with the Fox and Shawnee correspondents of the same mode, and with the Algonkin correspondents of the subjunctive mode.) Even substituting the Ojibwa participial for the subjunctive in these persons, THEY an.—US (excl.) represent a different structure from that of the Ojibwa correspondent; note also the same difference exists in the form for HE—US (excl.) (see the discussion of Algonkin and Menominee, pp. 252, 265). THEY an.—IT, THEM inan. is a true conjunctive and agrees exactly with the Fox and Shawnee form of the same mode, and the corresponding Algon-

kin form in the subjunctive mode. It should be noticed that Micmac partially shares the feature of the Peoria conjunctive. In the other forms of the conjunctive Peoria agrees with Fox (Shawnee nearly), Algonkin, Cree, and Micmac (treating conjunctive and subjunctive as interchangeable) in the terminations for WE (excl.)—THEE, YOU; HE—US (excl.); (with Natick also in WE (excl.)—THEE, YOU); with Ojibwa, Algonkin, and Cree in the form for I—YOU (pl.). The other forms call for no comment.

From its phonetics Peoria, as said above, seems to resemble Fox closely in some particulars. But its more northern relationships are shown by the fact that the nominative plural of the inanimate noun ends in *a*, agreeing absolutely with Cree, and also by the fact that it shares with Cree and Montagnais a set of terminations that correspond to the Fox interrogative conjunctive and subjunctive, but lack the final syllable *ni*, whereas Ojibwa and Algonkin have the *n* even if the final vowel may be lost.

In closing the discussion of Peoria it should be mentioned that this language, together with Fox, Sauk, Kickapoo, and Shawnee, are the only Algonquian languages in which every animate noun and inanimate noun are known positively to end in the nominative singular in *a* and *i*, respectively (excluding cases in which *wa* is lost phonetically in Shawnee). It is possible that others also may share this feature. Menominee and Ojibwa should be especially investigated with a view to securing additional information on this point.[1]

NATICK

That Natick belongs to the Central subdivision and not to the Eastern subdivision of the Eastern-Central major division of Algonquian languages is patent from the personal terminations of the verb in the present tense (affirmative form) of the indicative and suppositive (subjunctive) modes. Compare the following tables, extracted from Eliot:[2]

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans. . .	*n-*	*n—mun*		*k-*	*k—mwœ*	*-u*[3]	*-wog*
me	—	—	—	*k—ch*	*k—imwœ*	*n—k*	*n—kquog*
us excl. . .	—	—	—	*k—imun*	*k—imun*		*n—kqunnonog*
us incl. . .	—	—	—	—	—	*k—kqun*	
thee . . .	*k—sh*	*k—numun*	—	—	—	*k—k*	*k—kquog*
you . . .	*k—numwœ*	*k—numun*	—	—	—	*k—kœ*	*k—kœoog*
him . . .	*n—*[?]	*n—oun*		*k—*[?]	*k—au*	*-uh*	*-ouh*
them an. .	*n—óog*	*n—ónonog*		*k—œg*	*k—œg*	*-uh*	*-ouh*
it, them inan.(?)	*n—umun*	*n—umumun*		*k—umun*	*k—umumwœ*	*-umun*, *-um*[1]	*-umwog*

[1] Though the writer worked with the Mississippi band of Ojibwa (living at White Earth, Minn.) only a short time, he was able to determine the fact that in the independent mode the termination for THOU—ME in the same mode has a final whispered *-i*.

[2] In *Mass. Hist. Soc. Coll.*, 2d ser., IX, Boston, 1832.

[3] Taken from forms in J. H. Trumbull's Natick Dictionary (*Bull. 25, Bur. Amer. Ethnol.*).

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans. . .	*-on*	*-og*		*-an*	*-ôg*	*-og?*	*-ohettit?*
me	—	—	—	*-ɛan*	*-ɛôg*	*-it*	*-hettit*
us excl. . . .	—	—	—	*-ɛog*	*-ɛog*	*-kqueoġ*	*-kqueog*
us incl. . . .	—	—	—	—	—		
thee	*-non*	*-nog*	—	—	—	*-kquean*	*-kqueon*
you	*-nôg*	*-nog*	—	—	—	*-kqueòg*	*-kqueòg*
him	*-og*	*-ogkut*		*-adt*	*-ôg*	*-ont*	
them (an.) . .	*-og*	*-ogkut*		*-adt*	*-ôg*	*-ont* *-ohettit*	*-a'hettit*
it, them inan.(?)	*-umon*	*-umog*		*-uman*	*-umôg*	*-uk*	*-umohettit*

We will first take up the terminations of the indicative. I—YOU, YE intrans., YE—ME resemble the correspondents in Peoria and Menominee. Owing to the deficient orthography, a positive conclusion as to which of these Natick most closely resembles in the forms under discussion is not possible. It is probably the latter. WE (excl., intrans.); WE—THEE, YOU; THOU, YE—US (excl.); YE—HIM patently are to be associated with the Algonkin equivalents (and hence partly the Ojibwa ones). I, WE (excl.), THOU, YE—THEM an. presumably have the same affinities. HE—US (incl.) resembles the Shawnee (as certain others do as implied by the agreement with Algonkin) and Passamaquoddy (possibly also Peoria). HE—HIM apparently is to be connected with the Cree, Menominee, and Fox equivalent, but the phonetics are uncertain; THEY an.—THEM an. probably is to be associated with the Algonkin and Shawnee correspondent. WE (excl.)—HIM has a counterpart in Passamaquoddy. The forms with the inanimate object(s) are plainly composed of the intransitive forms and the pronominal element to be seen in Fox *-amw^a*, *-amowāte*, etc.: see section 34 of the Algonquian sketch in the Handbook of American Indian Languages (*Bulletin 40, B. A. E.*), pt. 1. The final *n* in I—IT, THOU—IT, HE—IT presumably is a purely phonetic accretion. It should be mentioned expressly that *-umwog* THEY an.—IT is not to be directly connected with Cree *-amwag*, as is shown by the forms of THEY an.—ME, THEE (Cree *ni—gwag*, *ki—gwag*, respectively). The corresponding inanimate forms of Delaware should be compared.

It should be noticed that the personal terminations of the suppositive mode do not have the *n* as do the Ojibwa group and Delaware, thus agreeing with Fox, etc., Cree-Montagnais, Menominee, and Micmac. A detailed discussion is uncalled for. Most of the forms have the closest correspondence to Fox. The following find their closest correspondents in Delaware: HE—THEE, HE—YOU, HE—THEM (one form) an., THEY an.; intransitive, THEY an.—ME, THEY an.—THEE, THEY an.—YOU, THEY an.—HIM, THEY an.—THEM; HE, THEY an.—US (excl.) resemble the Delaware correspondents.

The terminations of the "præter" tense of the suppositive mode are patently allied to those of the present tense of the same mode. The distinctive mark is a final *s*. It will be observed from the following table that the endings for HE—ME, HE—HIM, HE—THEM an. correspond to the Fox potential subjunctive:

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans. . .	*-os*	*-ogkis*		*-as*	*-ógkis*	*-ogkis*	*-ohettis*
me	—	—	—	*-cas*	*-cógkus*	*-is*	*-(c)hettis*
us excl. . .	—	—	—	*-cogkus*			
us incl. . .	—	—	—	—	—	*-kqucogkus*	*-kqucogkus*
thee . . .	*-nos*	*-nogkus*	—	—	—	*-kqueas*	*-kqueas*
you . . .	*-nógkus*	*-nogkus*	—	—	—	*-kquecógkus*	*-kqueógkus*
him . . .	*-nogkus*	*-nogkutus*		*-os*	*-ógkus*	*-os*	*-ahettis*
them . . .	*-nogkus*	*-nogkutus*		*-os*	*-ógkus*	*-os*	*-ahettis*
it, them in-an.(?)	*-umos*	*-umogkus*		*-umósa*	*-umógkus*	*-ukis*	*-umahettis*

The negative verb is formed by the insertion of *-œ-* (*o*), which apparently corresponds to Delaware *-wi-*. Examples are: Natick *kuppaumunœop* I DID NOT PAY THEE, Delaware *atta k'pendolowip* I DID NOT HEAR THEE.

The inanimate plural of nouns resembles the Piegan and Cheyenne forms.

The cluster *sk* is kept as in Cree and the Eastern subtype of the Eastern-Central major division of Algonquian languages; the combination of a sibilant + *p* and *t* presumably become *'p* and *'t*, respectively, though this is not certain, owing to the deficient alphabet: Cree *micpun* IT IS SNOWING, SNOW, Fox *me'pu-* TO SNOW, Natick *muhpoo* IT SNOWS; Cree *mictig* WOOD, Fox *me'tegwi* TREE, Shawnee *mtegwi*, Ojibwa *mezhtig* (Turtle Mountain), Natick *mehtug*, Delaware *mehittuck*, Minsi *michtuk;* Cree *miskawew* (Lacombe) HE FINDS HIM, Fox *me'k-* TO FIND, Malecite *muskuwan* HE FOUND HER, Natick *miskom* HE FINDS IT; Cree *maskwa* BEAR, Fox *ma'kwa*, Shawnee *m·kwa*, Ojibwa *ma'kwa*, Peoria *maxkwa*, Natick *mosq*. (There are also cases where a sibilant apparently is retained before *p* in Natick.) The characteristic consonantic clusters of the Eastern subtype are wanting, and it should be noticed that *l* also is lacking, confirming the opinion that Natick belongs to the Central type.

Owing to the deficient alphabet it is difficult to determine the true consonantic clusters of the language. The groups *-dt-* and *-gk-* and *-bp-* are merely graphic for strong sonants so characteristic of many American Indian languages. The accretion *-n-*, *-m-* occurs but does not agree with Ojibwa in usage, now having it where lacking in Ojibwa, now lacking it where Ojibwa has it. Thus, *wompi* WHITE,

Ojibwa *wâbi*, Fox *wâpi; wonkqussis* FOX (really a diminutive), Ojibwa *wā'guc; anoggs* STAR, Ojibwa *anang*, Delaware *allanque*, Peoria *alangwa*, Fox *Anāgwa*, Cree *atak* (for the phonetics, see the discussion of Cree, p. 239).

The lexical correspondence with the dialects of the Central subtype is far greater than is indicated in Trumbull's Natick Dictionary. (The same may be remarked of the Pequot-Mohegan material published by Speck and Prince.) However, at the present time it is impossible to say in which language the greatest number of correspondents are to be found.

Delaware

Zeisberger's material as contained in his grammar[1] is not good:[2] The forms of the various dialects are given without assigning each form to its proper dialect (see Zeisberger, p. 113, footnote); in the same paradigm some transitive forms have instrumentals, while others lack them; the spelling of one and the same personal termination is frequently absolutely inconsistent (e. g., *-que*, *-ke*); some passives are given as active transitive forms, and in at least one instance (possibly in more; see below) an inanimate objective form is given as animate. Under these unfortunate conditions the tables here given for the present indicative and subjunctive are bound to contain errors, for in the absence of Delaware informants representing the three dialects the writer has had to use discrimination as to the rejection or retention of certain forms. For this reason it is impossible to make very definite statements concerning the general relationships of Delaware among Algonquian languages. Yet the tables will have one result at least, albeit a negative one, namely, that the common supposition that Delaware is intimately connected with Eastern Algonquian (Micmac, Malecite, Passamaquoddy, Penobscot, and Abnaki) is certainly a mistaken one. On the possibility that the three Delaware divisions, Munsee, Unami, and Unalachtigo, were really separate tribes, each having special points of contact with different Central-Algonquian languages, though mutually intelligible, and that the apparent unity was only political, see page 279.

[1] A Grammar of the Language of the Lenno Lenape or Delaware Indians, Philadelphia, 1830.

[2] Others also have criticized Zeisberger adversely (see Brinton, The Lenâpé, p. 105, Philadelphia, 1885, who holds that the criticisms were unnecessarily severe. Correct his last reference to 1869-70, p. 105 ff).

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans.	*n'-*	*n'—{neen / hhena*		*k'-*	*k'—{hhima / newo*	*w'- / -u*	*{-wak / -newa / w—newa*
me	—	—	—	*k'—i*	*k'—ihhima*	*n'—{k / gun*	*{n'—{gaak / ge / genewa*
us excl.	—	—	—	*k'—{ineen / ihhena*	*k'—{ineen / ihhena / ihhenoak / ihhummena*	*n'—{guneen / guna*	*{n'—{geneen / gehhena / [n'?]—gunanak*
us incl.	—	—	—	—	—		*{k'—geneen / [k'?]—gunanak*
thee	*k'—{-ll / len*	*k'—{loneen / lohhena*	—	—	—	*k'—{k / gun*	*{k'—{gaak / ge / genewo*
you	*k'—lohhunao*	*k'—{lohhunao / lohhena*	—	—	—	*k'—guwa*	*{k'—gehhima / [k'?]—guwawak*
him	*n'—{an / a / awa*	*n'—{aneen / ohhena*		*k'—{an / a / awa*	*k'—{awawa / anewo*	*{-an / -awal / -gol*	*{-awall / -anewa / w'—anewo / -gal*
them an.	*n'—{awak / anewo*	*n'—{awuna / awunanak / awawuno / awawak*		*k'—{awak / anewo*	*k'—{awawak / awawall*	*-awak / w'—awak*	*{-awawak / w'—awawak / -awawall / -gok / w'—anawak*
it (them inan.?)	*n'—amen*	*n'—amahhena*		*[k—?]—amen*	*[k'?]—amohhuma*	*-amen*	*-amenewa*

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans.	{-ya / -yane	{-yenke		-yane	-yeque	-te	-chtite
me				-iyane	-iyeqtc	-ite	-ichtite
us excl.				-iyane	-iyenke	-quenke	-quenke
us incl.				-iyenke			
thee	-itane	-kenque	-unque	-anne	-aque	-quonne	-quonne
you	-iteque	-keque			-awake	-quque	-quque
him	{-achte / -ake			{-axonne / -achte	-achtique	{-achite / -akhittite	-achite
them an.	{-achtite / -awake		-awonque	{-awuwonne / -amane	[-ki?]		-awachtite
it (them inan.?)	-ama	{-ankenke / -ameneque			-omeque	-anke	-amichtite

We will first discuss the independent mode. The first thing that will be noticed is the diversity of forms for one and the same person as subject and object. Such diversity is not found among other Algonquian languages and at once arouses suspicion that the multiplicity of forms is due to the fact that the different forms really belong to separate dialects. When we note further that the different forms point to contact with different Algonquian languages, the probability of this inference is heightened. Thus, *n'—neen* WE (excl. intrans.), *k'—loneen* WE (excl.)—THEE, *k'—ineen* THOU,YE—US (excl.), agree with Cree-Montagnais; *n'—hhena* WE (excl., intrans.), *k'—lohhena* WE (excl.)—THEE, *k'—ihhena* THOU, YE—US (excl.) agree with Fox and Passamaquoddy; *n'—a* I—HIM, *k'—a* THOU—HIM agree with Passamaquoddy, Shawnee, and Ojibwa; *n'—awa* I—HIM, *k'—awa* THOU—HIM with Fox, Menominee, and Cree-Montagnais; *n'—guna* HE—US (excl.) agrees with Passamaquoddy, Shawnee, and Peoria(?); *n'—guneen* HE—US (excl.) with Fox, Cree-Montagnais, and Ojibwa; *n'—aneen* WE (excl.)—HIM agrees with Ojibwa and Cree-Montagnais; *n'—ohhena* WE (excl.)—HIM agrees with Fox.

The cognates of the remaining forms so far as available

will now be given: *n'—awak, k'—awak* I—THEM an., THOU—THEM an., respectively, have correspondents in Fox, Menominee, and Cree-Montagnais; *k'—awawa* YE—HIM agrees with Menominee and Cree-Montagnais; (*n'* ?)—*gunanak*, (*k'* ?)—*gunanak* THEY an.—US (excl. and incl., respectively) agree with Fox, Fort Totten Cree, and Ojibwa (the former also with the Cree of Horden and Montagnais); *k'—guwa* HE—YOU (pl.) has a correspondent in Shawnee, Passamaquoddy, and Ojibwa; *k'—guwawak* THEY an.—YOU (pl.), one in Fox, Menominee, and Cree-Montagnais; *n'—gun, k'—gun* have counterparts in the Montagnais forms for ON—ME, TE, respectively; *w'*—HE (intrans.) has a correspondent in Eastern Algonquian, *-u* HE intrans. corresponds to Fox, Shawnee, and Peoria *-wa*, Cree *-w*, Montagnais *-u; -gok* THEY an.—THEM an. is a passive and corresponds to Fox *-gōgi;* the forms *n'-, k'—ll, len; k'-; k'—i; -wak; n'—k, k'—k, n'—gook; k'—gook* are common Central Algonquian; *k'—ihenook* YE—US (excl.) is a pluralized form of *k'—ihhena; k'—awawak* YE—THEM an. agrees with Menominee and Cree-Montagnais and illustrates the same formation; *-awall* THEY an.—HIM (with phonetic differences) is close to the Ojibwa correspondent: if *w'-* is to be restored, it coincides exactly; as it stands it agrees with the Passamaquoddy correspondent; the forms *n'—gehhena, k'—gehhimo* are palpably passives and really should not have been included; *-gol* HE—HIM, to judge from Shawnee and Passamaquoddy, is really a passive; as a plural THEY an.—HIM, it seems an extension of this; cf. *n'—geneen* (graphic variant for *n'—guneen*); the same applies to *k'—geneen* (Fox *ke—gunāna;* there are correspondents in Ojibwa and Cree); *w'—anawak* (presumably a variant of *w'—anewak*) in its last part decidedly resembles Cree *mowanewun* THEY (indefinite third person plural animate) ARE EATING THEM (third person plural animate);[1] so it is clear that the terminations with *newo* are built up on some such system, though it is possible that some of the forms contain inanimate objects, not animate objects as given in the table (see the tables of the Ojibwa and Algonkin independent mode, pp. 263, 264). The forms *n'—an, k'—an, w'—an* are clearly of the same formation as Malecite *ktian* THOU TELLEST HIM; *tian, otian* HE TELLS HIM (stem *ti*); unfortunately there is no example available in Malecite for I—HIM. The forms with inanimate object(s) show the same type of formation as the Natick correspondents. The conjectural initial *k'* restored by the writer is confirmed by Sapir's notes. In closing the discussion of the independent mode it may be pointed out that it is impossible for one and the same dialect to contain both *k'—guwa* and (*k'* ?)—*guwawak* (see the tables for Fox, Cree, Shawnee, and Ojibwa).

The present subjunctive does not require so detailed a report. It has the nasal as have Ojibwa and Peoria, but otherwise the forms are

[1] Horden, p. 115.

far closer to Fox and Natick. The forms with the third person animate, singular and plural, as subject are the same in structure as those of the latter in nearly all cases and represent a formation otherwise unknown in Central and Eastern Algonquian. Some of the terminations seem peculiar to Delaware.

The forms *-inke* THEY an.—ME, *-inde* WE (excl. or incl. ?)—THEM, which, following Zeisberger, one would be forced to consider transitive forms of the subjunctive, in reality are indefinite passive conjunctives (Fox *-igi*, *-etci*, Peoria *-ingi*, *-ända*, respectively). Again following Zeisberger, *-geyenke*, *-geyane*, *-geyeque* THEY an.—US (excl.), THEE, YOU, respectively, would have to be considered transitive forms, but they are simple passives. The termination *-amanque* WE (excl.)—THEM an. really contains an inanimate object (see the tables for Fox and Ojibwa). Observe that I—IT has an exact correspondent in Shawnee. Certain persons have *n'* and *k'* prefixed indiscriminately in the same forms and have been omitted from the above scheme as unreal (*n'* and *k'* are suggestive of the indicative).

Delaware has a *p*, and *panne* preterite. The former is shared by Peoria, Natick, and Micmac; the latter is found in Ojibwa, Cree, Montagnais, Malecite, and Penobscot (for the combination of both in the subjunctive mode, see the discussion of Ojibwa, p. 269).

The suffix of the future *-tsch* is presumably the same as Fox *-tcā*^{i} VERILY.

It should be mentioned that Delaware has a relative mode that corresponds to the Fox, Shawnee, Micmac, and Peoria conjunctive. The forms given are too few to constitute a complete series but the important point that the first person singular intransitive ends in *-ya*, as in Shawnee (cf. Micmac), is certain.

Delaware has consonantic clusters but to what an extent is not clear from the inadequate phonetic system employed by Zeisberger. Some of these clusters are due to changes of a sibilant with a voiceless stop, e. g., *u'xkwäu* (Sapir) WOMAN, Cree *iskwē·u*. Others are patently due to the elimination of vowels, e. g., *n'milguneen* HE GIVES US (excl.), Fox *nemīnegunān*^{a}, *tulpe* TURTLE, Abnaki *tolba*, Seaticook *tûlipâs* (really a diminutive), Natick *tœnuppasog* (pl.). Others are due to the combination of the signs for the preterite with the final consonant of the present. A nasal before stops agrees with Peoria and Ojibwa in this use as opposed to Fox, Shawnee, Cree, Montagnais, and Menominee. The origin of other clusters is quite obscure. It is doubtful whether there are true long consonants in Delaware; there is reason to suspect that their apparent existence is due merely to a faulty or deficient phonetic system.

It was shown above how Delaware exhibits great diversity in points of contact with other Algonquian languages; attention may here be drawn to the fact that since Fox and Shawnee are closely

related to each other and both to the Eastern Algonquian languages (see the discussion of Sauk, Fox, etc., p. 258), agreement on the part of Delaware with any of these would imply a certain amount of agreement with the others, and as Fox has some decided points of contact with Cree, a similar state of affairs exists as to the latter language. However, these generalities do not answer specific questions. Though it is hazardous, as noted above, to give an opinion on the subject, the writer ventures to believe that Delaware as Zeisberger has presented it is not a single dialect but a composite. The facts of the case probably will be best satisfied by assuming one dialect the closest relationship of which was with Shawnee, but which shared with Fox (the phonetic representative of) *-pena* (Shawnee *-pe*), and another the closest relationship of which is with Cree-Montagnais, both of which assumed dialects had points of contact with Ojibwa and Natick. In the opinion of the writer there is not sufficient evidence at present to warrant the belief that another dialect had especially close relations with Eastern Algonquian, though it is possible there was a dialect that shared a few forms with Eastern Algonquian that were not shared by the other Delaware dialects. But all these theories must remain conjectures more or less plausible till all the Delaware dialects shall have been entirely restudied with the aid of living informants.

EASTERN SUBTYPE

The existing dialects composing this group are Micmac, Malecite, Passamaquoddy, Penobscot, and Abnaki. As mentioned above, these are all characterized by peculiar consonantic clusters and by certain grammatic terminations. However, as compared with Blackfoot, Cheyenne, or Arapaho they belong in the Central group, for there are numerous patent correspondents to the latter in vocabularies and in the discussion of Sauk, Fox, etc., it has been shown how intimately they are related to Fox and Shawnee in the verbal terminations. The correspondence in vocabulary with the Central type is far more general than has been supposed. The peculiar terminations are not very startling and show no more specialization than those of other Algonquian languages of the Central subtype. The peculiar terminations of the Micmac verb are due to the fact that the supposed indicatives are really correspondents to the Fox conjunctive. So in its last analysis the consonantal clusters are the distinguishing feature of the group. Below is a list of consonantic clusters in each of the following: Micmac (from one of the writer's longer texts), Malecite (from one of Mr. Mechling's longer texts), Passamaquoddy (from one of Doctor Gatschet's texts, of moderate length), and Penobscot (from Prof. J. Dyneley Prince's glossary in his article on Penobscot in *Amer. Anthr.*, N. S., XII, No. 2, 183–208, 1910):

MICMAC

Initial consonant	Second consonant of cluster												
	p	*b*	*t*	*d*	*k*	*g*	*m*	*n*	*l*	*s*	*tc*	*dj*	*L?*
p			*pt*		*pk*				*pl*				
b								*bn*	*bl*				
t	*tp*				*tk*								
d							*dm*	*dn*	*dl*				
k	*kp*		*kt*						*kl*	*ks*	*ktc*		*kL?*
g							*gm*	*gn*	*gl*				
m	*mp*		*mt*	*md*	*mk*				*ml*	*ms*	*mtc*		
n	*np*		*nt*		*nk*[1]		*nm*			*ns*	*ntc*	*ndj*	
l	*lp*	*'lb*	*lt*	*ld*	*lk*	*lg*	*lm*	*ln*		*ls*	*ltc*		
s	*sp*		*st*		*sk*		*sm*	*sn*	*sl*				
tc					*tck*								
dj					*djk*		*djm*	*djn*	*djl*				
x			*xt*							*xs*	*xtc*		

[1] Probable mishearing for *ηk*; *nk* in the Malecite and Passamaquoddy tables likewise is *ηk*.

The semivowel *w* occurs after *b*, *d*, *k*, *g*, *n*, *l*, *s*, *kk*, *pk*, *tk*, *nk*, *sk*, *tck*. The only long consonants observed are *tt* and *kk*. These are of rare occurrence.

It has not been possible as yet to determine whether all these clusters occur in the same morphologic parts of words or are due to combinations of different morphologic components. The same statement applies to the clusters of the other languages discussed.

In the text the following clusters occur finally: *tk*, *pk*, *mk*, *nk*, *lk*, *tck*, *djk*, *sk*, *kt*. Initially only *kl* occurs; *w* in initial combinations occurs only after *k*.

MALECITE

Initial consonant	Second member of cluster										
	p	*b*	*t*	*d*	*k*	*g*	*m*	*n*	*l*	*s*	*tc*
p			*pt*		*pk*					*ps*	
b											
t	*tp*	*tb*			*tk*	*tg*	*tm*		*tl*		
d									*dl*		
k	*kp*		*kt*				*km*	*kn*	*kl*	*ks*	*ktc*
g							*gm*	*gn*			
m	*mp*			*md*	*mk*			*mn*		*ms*	
n	*np*		*nt*	*nd*	*nk*						
l	*lp*			*ld*	*lk*		*lm*	*ln*		*ls*	
s	*sp*		*st*		*sk*				*sl*		
z									*zl*		
tc					*tck*						

The semivowel *w* occurs after *b*, *k*, *g*, *s*, *tk*, *tg*, *pk*, *sk*.

The following clusters of three consonants occur: *msk*, *stck*, *std*.

The initial clusters that occur in the text are: *sk*, *sp*, *km*, *kn*, *tb*, *ps*, *sl*, *tl*. The semivowel *w* in initial combinations occurs only after *k* and *g*. The clusters which occur terminally are: *kt*, *ktc*, *ptc*.

PASSAMAQUODDY

Initial consonant	Second member of cluster											
	p	*b*	*t*	*d*	*k*	*g*	*m*	*n*	*l*	*s*	*tc*	*ts*
p			*pt*				*pm*	*pn*				
b												
t					*tk*							
d									*dl*			
k	*kp*		*kt*							*ks*	*ktc*	
g												
m			*mt*	*md*	*mk*			*mn*		*ms*		
n	*np*								*nl*	*ns*		*tsn*
l			*lt*			*lg*		*ln*				
s	*sp*		*st*		*sk*							
tc					*tck*							
x			*xt*		*xk*			*xn*	*xl*	*xs*		

The following clusters of three consonants occur: *ntk*, *nsk*, *ksk*, *psk*, *stck*, *xsm*.

The semivowel *w* occurs after *k*, *g*, *l*, *sk*, *xk*, *tk*, *lg*.

The following two long consonants occur: *ss*, *ll*.

These clusters have been observed initially: *kt*, *kp*, *km*, *ks*, *ktc*. Finally, the cluster *sk* was observed. The semivowel *w* was noted as occurring after *k* and *g* of initial consonants.

PENOBSCOT

Initial consonant	Second member of cluster										
	p	*b*	*t*	*d*	*k*	*g*	*m*	*n*	*l*	*s*	*z*
p									*pl*	*ps*	
b			*bt*								
t					*tk*						
d											
k										*ks*	
g									*gl*		
m				*md*	*mk*	*mg*					
n		*nb*	*nt*	*nd*	*nk*	*ng*					*nz*
l			*lt*	*ld*	*lk*	*lg*		*ln*			
s	*sp*		*st*	*sd*	*sk*						
zn			*zt*					*zn*			
tc					*tck*						

The semivowel *w* occurs after *k*, *g*, *d*, *l*, *m*, *sk*, *mk*, *tc*.

The only true consonantal clusters observed initially were *sk*, *sp*. After initial *g* and *k*, *w* occurs. The only final consonantic cluster noted was *ps*.

The following long consonants were noted: *kk*, *pp*, *ll*, *ss*.

Two clusters of three consonants were observed: *bsk*, *nsk*.

An examination of the tables will show that the old view that Micmac alone of Eastern Algonquian differed especially from Central Algonquian by reason of clusters, is incorrect.

The consonantal clusters of such words that have known equivalents in Central Algonquian are due for the greater part to the elimination of vowels. Thus Micmac *kēsaptug* AFTER HE LOOKED AT IT (for *kēsi+āpi+t+ug;* Fox *kīcāpitAg*^{i}), *wApk* IN THE MORNING (Fox *wâbAg*^{i}), *mAndu* DEVIL (Fox *manitōw*^{a}), *elmied* HE WENT ON (Malecite *elimialit* WHEN HE (obs.) WENT AWAY, Fox initial stem *anemi* YON WAY); *helno*, Penobscot *alnobe* INDIAN (Shawnee *hileni*, Ojibwa *ineni*, Fox *ineniw*^{a}, Cree *iyiniw* MAN); Penobscot *spumki* HEAVEN, Abnaki *spemk* HEAVEN (Passamaquoddy *spemek* HIGH, Cree *ishpimik*, Ojibwa *ishpiming*, Shawnee *spemegi*, Fox *a'pemeg*^{i}, Peoria *pämingi* (cf. Menominee *Acpämiyᴀ*); Micmac *kospemk* AT THE LAKE (Passamaquoddy *kûspemuk* ON A LAKE; Cree *kuspamuw* ROAD WHICH GOES BESIDE TIMBER WHERE THERE IS WATER); Penobscot *pebōnkik* IN THE NORTH (Fox *pepōn*^{i}*+a'kig*^{i}); Penobscot *wōbtegua* WILD GOOSE (for *wōb-* cf. Fox *wâpi-*, Natick *wompi-* WHITE); Penobscot *n'wewel̈damen* I KNOW IT (*-el-* = Fox *-äne-*); Micmac *elmōdjig* DOGS; Malecite *ulamus* (really a diminutive), Delaware *alum;* Ojibwa *animosh*, Fox *Anemō'*^{a}, Natick *anum*, Cree *atim* (for the phonetics see the discussion of Cree, p. 239); Abnaki *kidasn̥'m'* (Sapir) THY STONE (Fox *ketᴀ'seni'mi*, cf. Abnaki *sin'* STONE); Malecite *k'ᵖmǫ'sêba'* (Sapir) YE RUN (Fox *kepemusäpwa*). When a vowel is lost after *l* (corresponding to Fox *n*, Shawnee and Delaware *l*) and a consonantal cluster arises this way, or if the *l* thereby becomes final, the preceding vowel takes an *o* (*u*) tinge; if the preceding vowel be *i*, then *o* attaches itself thereto. To make clear the examples of this it is necessary to state that the cluster *pw* becomes *p* or *b* (note that *pw* does not occur in the tables given above). Thus Malecite *kAnimiol* I SEE THEE (stem *nimi;* intervocalic instrumental *h* lost), Passamaquoddy *ktekAmAl* I STRIKE THEE (*-m-* is an instrumental particle); compare Fox *ke—ne*, Shawnee *ke—le;* for Malecite *kAnimiolpa* I SEE YOU (pl.), Passamaquoddy *ktekmulpa* I STRIKE YOU (pl.); cf. Fox *ke—nepwa*, Shawnee *ke—lepwa*. (It may be as well to mention that Fox *ke—nepwa* is made up of *ke—pwa* and *ne*, and is not a morphologic unit.) Micmac *dagAmulkw*^{a} HE STRIKES US, inclusive, corresponds to Fox *-menAgwe*, in which *m* is the instrumental particle, *e* the phonetic insert, *nAgwe* (Shawnee *-lagwe*) the termination for

HE—US (incl.) of the conjunctive mode. The participial *-ultitcig* in Micmac (and the corresponding forms of the other dialects) corresponds to Fox *-netīteigi*, in which *n* is the instrumental particle, *e* the phonetic insert, *tī* the sign of reciprocity, *tcigi* the third person animate intransitive of the participial.

It should be noted that the elimination of vowels sometimes causes nasals and liquids to become syllabic, a phenomenon which Sanskritists call *samprasāraṇa*, e. g. Passamaquoddy *ɳkwaxsan* RED STONE (PIPE) (cf. Fox *meckw-* + *asen*^{i}).

Especially should it be observed that the clusters, consisting of a sibilant + *k* or *p*, are kept exactly as in Cree (see the discussion of Cree, p. 238). Thus Cree *amisk* BEAVER, Stockbridge (Edwards) *amisque*, Ojibwa *ami'k*, Delaware *amochk*, Fox *ame'kw*^{a}, Shawnee *hamäkwa*, Peoria *amäkwa*, Abnaki *pepSnemesk8* WINTER BEAVER, Micmac *pŭlŭmskw* BEAVER OF THIRD YEAR (Rand); Cree *miskawew* HE FINDS HIM, HER, Fox *me'kawäw*^{a} HE FINDS HIM, HER, Natick *miskom* HE FINDS IT, Malecite *muskuwan* HE FOUND HER; Cree *ishpimik* ABOVE, Ojibwa *ishpiming*, Fox *a'pemegi*, Peoria *pämingi*, Shawnee *spemegi*, Menominee *icpämiyA* ABOVE, Penobscot *spumki* HEAVEN, Abnaki *spemk* HEAVEN, Passamaquoddy *spemek* HIGH; Cree *kuspamuw* ROAD WHICH GOES BESIDE TIMBER WHERE THERE IS WATER, Micmac *kōspemk* AT THE LAKE, Passamaquoddy *kûspemuk* ON A LAKE; Cree *iskwew* WOMAN, Fox *i'kwäw*^{a}, Natick *squaw*, Delaware *ochqueu*, Micmac *kēsigō-ēskw*^{a} OLD WOMAN. Since *sp* and *sk* are original, it is probable that *st* is likewise. The cluster is not common, and the writer has not found in Central Algonquian analogues as yet to such words as contain it. Yet it is perhaps possible to establish the claim indirectly. Micmac *kēsēwistōdidj* means after THEY HAD FINISHED SPEAKING; it is to be presumed that the *stō* corresponds to Fox *'tō* (see section 21.7 of the Algonquian sketch in the Handbook of American Indian Languages, part 1). The *'t* points phonetically to an original **st*. These clusters strongly point to a more northern origin than Fox had.

It is true that the origin of many clusters can not be explained at present, but it is not unreasonable to believe that the application of the foregoing principles will explain many more when our knowledge of the languages shall have increased, and perhaps phonetic laws yet to be discovered will account for the remainder. For the consonantic clusters in Piegan, Cheyenne, Arapaho, and Eastern Algonquian are so fundamentally different that it is improbable that any of their types are original. It may be assumed, then, provisionally that the Central type, from which true consonantic clusters are lacking, with certain limitations, shows the most primitive condition of Algonquian languages.

An original *o* or *u* under unknown conditions seems to umlaut the vowel of the preceding syllable to *o*, *u*, as does postconsonantal *w*. Thus, Malecite *tiogul* HE WAS TOLD; this stands for **tegōl^{i}* (cf. Shawnee *otegōl^{i}* HE WAS TOLD), in which *o—gōl^{i}* is the passive termination and *te* the initial stem. Penobscot *k'namiogona* HE SEES US (incl.), Abnaki *k'namiogonna* are additional illustrations. The terminations are for **ke—guna* (cf. Shawnee); *-he-*, the instrumental + the *e* insert, has suffered the changes shown above and the *h* is lost; the stem is *nami*. Passamaquoddy *ndekamugun* HE STRIKES US (excl.) and *kdekamugun* HE STRIKES US (incl.) are for **ne—meguna* and **ke—meguna*, respectively; *m* is the instrumental particle; *e* the phonetic insert which has been umlauted to *u*. Other examples of this umlauting will be mentioned in the discussion of the verbal endings. Examples in which a *w* (either maintained or lost) has caused umlaut are: Penobscot *namiukw* HE SEES ME (for *n'n-*), Abnaki *n'namiok*, Passamaquoddy *ndekamuk* HE STRIKES ME (Fox *ne—gwa*; rest explained above); *ktekamuk* HE STRIKES THEE (Fox *ke—gwa*).

Below are tables of such forms of the Passamaquoddy independent mode (present tense) and of the Micmac conjunctive (which is used like the indicative) mode as the writer has been able to extract from Doctor Gatschet's papers.

PASSAMAQUODDY PRESENT INDEPENDENT MODE

	I	we excl.	we incl.	thou	ye	he	they (an.)
Intrans. . .	*n-*	*n—bʌn*	*k—bʌn*	*k-*	*k—ba*		*-wuk*
me . .	—	—	—	*k—i*	*k—iba*	*n—k*	
us excl. . .	—	—	—	*k—ibʌn*	*k—ibʌn*	*n—gun*	*n—gunwuk*
us incl. . .	—	—	—	—	—	*k—gun*	*k—gunwuk*
thee . . .	*k—l*	*k—lpɛn*	—	—	—	*k—k*	*k—guk*
you . . .	*k—lpa*	*k—lpɛn*	—	—	—	*k—guwa*	*k—gua*
him . . .	*n—a*	*n—an*		*k—a*	*k—awa*	*u—al*	*-awal*
them (an.)	*n—ak*		*k—anwuk*	*k—ak*	*k—awa*	*u—a*	*u—awa*

MICMAC CONJUNCTIVE MODE

	I	we excl.	we incl.	thou	ye	he	they (an.)
me . . .	—	—	—	*-in*		*-it*	*-idjik*
us excl. . .	—	—	—	*-ick*	*-ick*		
us incl. . .	—	—	—	—	—	*-lk8*	*-lkwik*
thee . . .	*-l*	*-lck*	—	—	—	*-sk*	*-skik*
you . . .	*-lox*	*-lck*	—	—	—	*-lox*	*-lox*
him . . .	*-uk*	*-ugɛt*			*-ox*	*-adl*	*-adidl*
them (an.) .	*-gik*	*-ugidjik*			*-ox*	*-adji*	*-adidjik*

In comparing the forms with other Algonquian languages it is necessary to keep in mind the phonetic changes hinted at above. In the Passamaquoddy independent mode the *u* and *w* umlaut occurs in the forms for HE—ME, US (incl. and excl.), THEE; THEY an.—ME, US (excl. and incl.), THEE, YOU. The agreement in the use of *l* with Shawnee, etc., in contrast with Fox, Ojibwa, Cree, etc., *n* should be noted; also the elimination of vowels and the phonetic changes involved.

While treating of the linguistic relations of Fox and Shawnee, it was necessary to treat Passamaquoddy at some length. It was shown that Passamaquoddy is very closely related to Fox on the one hand and to Shawnee on the other. The form for WE (incl.)—THEM an. approximates most closely the corresponding Cree and Montagnais form, though not identical with them. The relationship is the same in the case of WE (excl.)—HIM. This last approximates the form in Cree, Montagnais, Delaware (one form), and Ojibwa; it coincides with the analogue in Natick and by chance with that in Cheyenne. We say by chance, as Cheyenne has no other special agreements with Eastern Algonquian, whereas, as was pointed out in the discussion of Fox, Natick happens to share another termination. The form for THEY an.—US (incl.) approximates the Cree, Montagnais, and Menominee analogues. The agreement of the last named with Passamaquoddy is undoubtedly fortuitous, due simply to the fact that Menominee as well as Eastern Algonquian shows certain affinities with Cree-Montagnais. The form for YE—THEM an. apparently is the same as that for YE—HIM. The form for THEY an.—US (excl.) is based on the same formation as THEY an.—US (incl.). The fact that Passamaquoddy shares certain persons of the independent mode with Ojibwa was shown in the discussion of Fox. But it should be noted that all such persons are likewise shared by Shawnee.

There is given below a table of the Abnaki present independent mode so far as the writer has been able to extract the terminations from Doctor Sapir's notes:

	I	we excl.	we incl.	thou	ye	he	they an.
Intrans. . .	*nI-* (*n-*)	(*n*)—*bIna'*		*ki-* (*k-*)	*k—ba'*		*-wak'*
me. . . .	—	—	—	*k—i*			(*n*)—*gǫk'*
us excl. . .	—	—	—	*k—ibIna'*	*k—ibIna'*	[(*n*)—*gabIna'*]	
us incl. . .	—	—	—	—	—		
thee . . .	*k—i*	*k—lbIna'*	—	—	—		*k—gǫk'*
you . . .	*k—l.ba'*	*k—lbIna'*	—	—	—		
him . . .	(*n*)—*ą'*	(*n*)—*ąbIna'*		*k—ą*	*k—Amba'*	*o—ą'*	
them an. .	(*n*)—*Aŋk'*			*k—Aŋk'*	*k—Amba'*	*o—ąl*	

A detailed discussion is uncalled for. It should, however, be noted that Abnaki agrees with Fox as opposed to Shawnee (and Passamaquoddy) in the forms for YE—HIM, THEM an. Initial *n* apparently is lost before certain consonants. This accounts for the strange appearance of certain forms. The form for WE (excl.)—HIM agrees with Fox as opposed to Passamaquoddy. HE—US (excl.) is the equivalent of Fox *ne—gōpena*, of the indefinite passive, independent mode. It may be noted that Malecite agrees with Passamaquoddy in this respect. From Doctor Sapir's notes it would seem that in Malecite a faint final *w* is retained after *k'* where etymologically required, which is lost (or at least not recorded by Doctor Gatschet) in Passamaquoddy. The writer's available material is too scanty in the case of Malecite and Penobscot to give tables for them; but it is certain that they agreed essentially with Passamaquoddy and Abnaki.

As Eastern Algonquian shows certain points in common with Cree-Montagnais as opposed to Ojibwa, etc. (see pp. 238, 284) it may be that the *pan* preterite is really a point of contact between Eastern Algonquian and the former; but this is forcing matters, as certain personal endings of Eastern Algonquian agree with Ojibwa, etc. (those shared also by Shawnee), as opposed to Cree-Montagnais. (For additional points of contact between Eastern Algonquian and Cree-Montagnais, see p. 245, in the discussion of the Micmac conjunctive.) Despite the usual view of the subject, the relations of Eastern Algonquian with Delaware are not close. On consulting the tables given in the discussion of Delaware it will be seen how few terminations of the independent mode phonetically coincide with those of Passamaquoddy. There are no agreements between the two that are not shared either by Fox or Shawnee; as a matter of fact, Delaware agrees in some cases with Fox as opposed to Shawnee and Eastern Algonquian. But, as was shown in the discussion of Delaware, the existing material is poor, and it is clear that the several Delaware dialects had different linguistic relations. At present, however, there is not sufficient evidence to show that any one of the dialects had especially close relations with the Eastern branch of the Eastern-Central group of Algonquian languages.

A table of the Micmac conjunctive from Doctor Gatschet's notes is here given because the one from the writer's notes and texts contains too many unfilled schedules. The table is supplemented by the form for HE—US (excl.), *amet*, and these intransitive forms are given:

I WE (excl.)	WE (incl.)	THOU YE	HE THEY (an.)	IT, THEY (inan.)
-i	*-ieg*	*-igwa*	*-in*	*-yo -d -djig*

The forms which Doctor Gatschet gives as *-adl* and *-adidl* are considered broken Micmac at St. Anne de Restigouche. The current forms are *-adjl̥*, *-adidjl̥*, yet one of the informants, a woman upward of eighty, constantly used the forms given by Doctor Gatschet. The question of dialectic variation must be taken into account, as Doctor Gatschet's material came from New Brunswick. Final surds and sonants are exceedingly hard to distinguish at St. Anne de Restigouche, but this difficulty is not encountered with those occupying a medial position. In the opinion of the writer there are, finally, neither true surds nor sonants, only intermediates.

A detailed discussion of the forms is uncalled for. There is *l* corresponding to Fox *n*, of course, but the forms themselves morphologically approximate very closely the Fox analogues; as was pointed out in the discussion of Sauk, etc., however, certain terminations resemble the Fox participial rather than the subjunctive, thus partially agreeing with the Peoria conjunctive and the Cree subjunctive. The termination for the first person singular intransitive apparently coincides phonetically with the Shawnee and Delaware analogue. The form for HE—US (excl.) is important as showing the fact that the relations with Ojibwa, Delaware, and Natick are not close. It should be noted that the forms with the third person singular animate as subject suggest relationship with the Fox subjunctive rather than conjunctive. The terminations *-adl* and *-adidl* certainly contain the obvialitive *l*, but though the former is clear enough in formation (*-ad*+*l*), the latter is not.

It may be noted that there is another conjunctive form for the third singular, namely, *-tc*, e. g., *pemietc* WHEN HE WALKS ALONG; this resembles closely the Fox analogue. The other terminations seem to be based on the ordinary conjunctive mode with the addition of a suffix (?) *g* with certain phonetic modifications.

There is a dual, e. g., *kispanadidjig* THEY ARE TIRED, as compared with *kispanedjig* THEY TWO ARE TIRED. The actual terminations seem to be the same; the *-di-* on the face of it apparently corresponds to Fox *-tī-*, the sign of reciprocity. This is brought out by such expressions as *mAdn̥didjig* THEY (more than two) FOUGHT. The analysis of the example is *mAd* TO FIGHT, *n̥* instrumental particle, *-di-* reciprocal sign, *-djig* terminations. The expression then means THEY FOUGHT TOGETHER, the idea of plurality or duality originally not being expressed. Then the later restriction of such forms to plurality would be merely a specialization.

To sum up the general relations of Eastern Algonquian, we may say that the group is very intimately related to Fox and Shawnee; next, to Cree-Montagnais; not closely to Ojibwa; and remotely to Delaware and Natick. The relations with Piegan are not sufficiently clear to justify a positive statement, but it should be observed that

certain personal terminations of the independent mode have close analogues (which are shared by Sauk, Fox, Kickapoo, and partially by Shawnee).

The material at the writer's disposal does not permit a strong characterization of the individual traits of the various dialects composing the Eastern subtype of the major Eastern-Central division of Algonquian languages. According to J. Dyneley Prince and W. Mechling (personal communications), Penobscot, Abnaki, Passamaquoddy, and Malecite are more closely related to one another than any one is to Micmac. According to information received, Micmac can understand Malecite without much difficulty. A characteristic of Micmac is the apparent lack of forms corresponding to the independent mode of the other dialects; but the latter have forms corresponding to the Micmac conjunctive. The preterite "indicative" of Micmac is based on the conjunctive, whereas in the other dialects it is based on the forms of the independent mode; but the principle of formation is alike. According to Prince, the differentiation of Penobscot and Abnaki is comparatively recent. The writer, however, does not consider Abnaki nasalized vowels archaic; on the contrary, he believes the Penobscot pure vowels more original. Passamaquoddy and Malecite are very similar to each other and may prove to be practically identical. In closing the discussion of the Eastern subtype, the writer thinks it well to add that in his judgment the *r* which appears in the works of the older writers was an intermediate between *r* and *l;* hence they recorded it with the sound with which they associated it.

Summary

Algonquian tribes linguistically fall into four major divisions: Blackfoot, Cheyenne, Arapaho, and Eastern-Central. The Blackfoot major group shows some unmistakable signs of contact with Sauk, Fox, and Kickapoo of the Central subtype and with Eastern Algonquian. Cheyenne exhibits affinities with the Ojibwa subdivision of Central Algonquian, though it has also some rather northern affinities. It is premature to venture an opinion with which language or languages Arapaho is to be most intimately associated. The Eastern-Central major division is divisible into two subtypes, Central and Eastern. The Central subtype has further groupings within itself: Cree-Montagnais, Menominee, Sauk, Fox, Kickapoo, and Shawnee; Ojibwa, Ottawa, Potawatomi, Algonkin, and Peoria; Delaware (see the discussion of this language, p. 279), and Natick. Eastern Algonquian may perhaps be divided into two groups, Micmac, on the one hand, and the remaining extant dialects (which, collectively, may be designated Abnaki), on the other. The very intimate connection of Eastern Algonquian with Sauk, Fox, and Kickapoo, as well with

Shawnee, should be emphasized. Owing to the peculiarity in Micmac, noted on page 289, it is not possible to be so confident as to whether this relationship extends as intimately in this language; but the conjunctive mode points in this direction.[1]

[1] It will be noticed that on the accompanying map showing the distribution and interrelation of the Algonquian dialects (pl. 103), there are many names of dialects not dealt with systematically in the texts. This is because the existing material did not make such treatment feasible. The author does not doubt that Nanticoke, etc., are Algonquian dialects. (Dr. Frank G. Speck, of the University of Pennsylvania, has kindly made for the use of the writer extracts from manuscripts in the library of the American Philosophical Society, demonstrating that Nanticoke belongs to the Eastern-Central major division of Algonquian languages. Unfortunately verbal forms were practically absent; so until our knowledge of Unami, Unalachtigo, and Munsee shall be more extensive, it will not be possible to settle definitely the exact position of Nanticoke. Hence it is probable that the other southern Algonquian dialects along the Atlantic coast belong to the Eastern-Central division.) In this connection it may be stated that Pennacook is assigned to the Abnaki-Micmac group, partly for geographical reasons, partly on account of the history of the tribe. The early French and English writers can not be relied on regarding the intimate or remote relationships among the various Algonquian dialects, except where they can be corroborated by existing dialects. The reason for this is not far to seek. As before stated (p. 237), the Central Algonquian dialects are very intimately related, and philology at the time had not reached a point where fine distinctions could be made. It will be remembered how recently it has been possible for philology to determine the interrelations of the dialects within the major divisions of Indo-European languages, and how deficient even to-day is our knowledge of the interrelations of the major divisions of those languages. Moreover, inaccurate phonetics would blur out many distinctive points. It is simply a waste of time to attempt to unravel the vagaries of the orthography of the older writers in the case of dialects existing to-day. The accompanying map does not attempt to represent the distribution of Algonquian dialects at any one period. It will be remembered that our knowledge of the various tribes was not synchronous. It would have been feasible to make a map showing their localities, with dates, provided the interrelations were not shown; but the prime object was to show the interrelations. (A case in point is the localization of the habitat of the Sauk. They were first known in the eastern peninsula of Michigan, only later in the locality shown on the map.) The authority for the localizations can usually be found in the Handbook of American Indians (*Bulletin 30, B. A. E.*). With respect to the map the following departures from the color scheme should be noted: Prince Edward Island and Cape Breton formed part of the Micmac territory. Manitoulin Island and the peninsula between Georgian Bay and Lake Huron were occupied by Ottawa and the peninsula between Lakes Superior and Michigan east of the Menominee by Chippewa.

It may be noted that under the name Abnaki, the Abnaki (properly speaking), Malecite, Passamaquoddy, and Penobscot are included.

The form Chippewa on the map follows that of the Handbook of American Indians; the form Ojibwa in the text conforms to the orthography of the Handbook of American Indian Languages (*Bulletin 40, B. A. E.*).

From Edwards' Observations on the Language of the Muhhekaneew Indians, reprinted in Mass. Hist. Coll., 2d ser., X (Boston, 1823), p. 81 ff., some notes may be made on the language of the Indians of Stockbridge, Mass., though unsystematically. The words *amisquc* BEAVER, *spummuck* HEAVEN at once show the dialect does not belong with Delaware. So does *paumscauk* WE (excl. or incl.?) WALKING (Fox *pämusäyäge* or *-yᵃgwᵉ*) by lacking a nasal in the pronominal ending. The words *npehtuhquisschnuh* WE ARE TALL, *nmeetschnuh* WE EAT (both exclusive in formation) demonstrate that the dialect is not to be associated with Natick, Delaware, or the Abnaki group. The termination *n—nuh* suggests that the termination for WE incl. intrans. was *k—nuh:* this last coincides with a variant Cree correspondent given by Lacombe. On the other hand *n—nuh* and *k—nuh* resemble very much the Menominee correspondents save the lack of the *m* syllable. On a later occasion the writer will return to this particular point. Here it may be said that the *m* + vowel is not so vitally important as the other portions of the termination. The phonetics of *metooque* WOOD are also against intimate relationship with Cree. The word *ktuhwhunoohmuh* I LOVE YOU resembles closest the Natick form; but *nduhwhunuw* I LOVE HIM has a different look. The phonetics of *nogh* MY FATHER suggest affinity with Delaware; cf. *nužwa* MY FATHER (Sapir). These notes were made subsequent to the printing of the map (pl. 103).

It is needless to say that all Algonquian tribes and subtribes could not be shown on the map for want of space.

ADDENDUM

It was impossible to insert in the text the results of the writer's field work in the summer, autumn, and winter of 1912, but the most important results may be summarized briefly here.

Piegan (of Montana) has whispered vowels terminally after *w* and nasals; *x* is distinctly post-velar; final *k* is distinctly aspirated. Gros Ventre (Atsina) sheds little light on Arapaho, sharing with the latter practically all deviations from normal Algonquian. Potawatomi differs more from Ojibwa, Ottawa, and Algonkin than these do from one another. According to communications from Doctor Sapir of the Geological Survey of Canada and Doctor Radin of the International School of Ethnology and Archeology, the Ojibwa dialect at Sarnia, Ontario, seems to be highly specialized. The intimation given in the section on Delaware that Zeisberger's material represents no single dialect was borne out by the writer's experience with the Munsee of Kansas and the Delaware of Oklahoma. Apparently no distinction can be drawn to-day between Unami and Unalachtigo. The phonetic system of Zeisberger is very deficient. Every stop occurs as surd, sonant (after nasals), surd aspirate (terminally), and glottalized. Voiceless *l* occurs medially before consonants in both Delaware and Munsee, and terminally in the latter (where it seemingly is lost in the former). Long consonants are common, also consonantic clusters, owing largely to elimination of vowels. Umlaut is caused by *w*. On the whole, both Delaware and Munsee have suffered very considerable phonetic changes from normal Central Algonquian; Munsee is by far the more archaic of the two. In Munsee whispered vowels occur initially, medially, and terminally (after *w*). In Delaware seemingly they are found medially and terminally after *w*. In both, *s*, *y*, *w*, and *l* occur glottalized as well. The variety of forms given in the table is due in part to dialect mixture, in part to phonetic changes. Some of the forms are due possibly to mishearing; some contain double objects; others seemingly are to distinguish third persons; still others owe their origin to causes which are unknown although the forms exist to-day. The statement that one dialect had the closest relations with Cree-Montagnais and another with Shawnee, is wrong. Zeisberger's inadequate phonetics were wrongly interpreted. It is clear that both Delaware and Munsee are closely related and, though they can not be easily classed with any other large group, it is clear that they approximate the Ojibwa group in important points, and

Ottawa in particular. Phonetically, however, in some points they approximate more closely Peoria and other languages belonging to the same group. (Zeisberger does not distinguish *-k'* [Fox *-g'*] and *-kw*^{a} [Fox *-gw*^{a}]: both are written *-k*; the case of *-mw*^{a}, which remains in Munsee but undergoes certain changes in Delaware, is somewhat similar.) From Doctor Sapir's notes it would seem that the Delaware of Oklahoma and that of Canada (Smoothtown) differ in certain points.

1. Comparative Table of the Cree (Moose and Fort Totten), Menominee, Fox, Shawnee, Passamaquoddy, Abnaki, Ojibwa, Algonkin, Peoria, Natick, and Delaware Independent Mode, Present Tense

2. Comparative Table of the Cree (Moose and East Main), Fox, Shawnee, Ojibwa, Algonkin, Peoria, Natick, and Delaware Subjunctive Mode, Present Tense

3. Comparative Table of the Fox, Shawnee, Micmac, and Peoria Conjunctive Mode

	D.	k'— -ll / ten	k'— lonern / lokkena	—	—	—	k' k / gun	k'— gook / ge / genewa
you	(M.)	ke—tinnawow	ke—tinan		—	—	ke—kowow	ke—kowowuk
	(F. T.)	ki—tinâwâwa	ki—tinân	—	—	—	ki—guwâwa	ki—guwâwag
	Men.	ki—ninimiwâwa	ki—ninemindâwa	—	—	—	ki—guwâwa	ki—guwâwag
	F.	ke—nepua	ke—nepena	—	—	—	ke—guwâwa	ke—guwâwag
	S	ki—lepwa	ki—lepe	—	—	—	ki—gowa	ki—gowâgi
	Pass.	k—lpa	k—lpen	—	—	—	k—guwa	k—gua
	Ab.	k—lba'	k-lbina'	—	—	—		
	Oj.	ki—nim	ki—gom	—	—	—	ki—gowa	ki—gowog
	A.	ki—nim	ki—nimin	—	—	—	ki—gowa	ki—gowak
	P.	ki—limwa		—	—	—		
	N	k—numiwo	k—numun	—	—	—	k—ko	k—kwoog
	D.	k'—lokkuma	k'— lokkumo / lokkena	—	—	—	k'—guwa	k'—gehhimo / k'—[?]guwawak
him	C (M.)	ne—ow	ne—anan	ke—ananow	ke—ow	ke—owow	-ðð	-ðwuk
	C (F. T.)	ni—âwa	ni—ânân	ki—ânân	ki—âwa	ki—âwâwa	-ĕu	-ewag
	Men.	ni—âwa	ni—andâwa	ki—andâwa	ki—âwa	ki—âwâwa	-âwa	-âwag
	F	ne—âwa	ne—âpena	ke—âpena	ke—âwa	ke—âpwa	-âwa	-âwagi
	S	ni—a	ni—âpe	ki—âpe	ki—a	ki—âwa	ô—âli	ô—âwâli
	Pass.	n—a	n—an		k—a	k—awa	u—al	-awal
	Ab.	(n)—a'	(n)—âbina'		k—a	k—amba'	o—a'	
	Oj.	nin—a	nin—anan	ki—anan	ki—a	ki—âwa	o—an	o—âwan
	A	ni—a	ni—anan	ki—anan	ki—a	ki—awa	o—an	o—awan
	P.	nâ—a					-a	
	N.	n—[?]	n—oun		k—[?]	k—au	-uh	-auh
	D.	n'— an / a / awa	n'— aneen / ahhena		k'— an / a / awa	k'— awawa / anewa	-an / -awal / -gal	-awali / -anewa / w'—anewa / -gal
them an.	C. (M.)	ne—owuk	ne—ananuk	ke—ananowuk	ke—owuk	ke—owowuk	-ðð	-ðwuk
	C (F. T.)	ni—âwag	ni—ânânig	ki—ânânig	ki—âwag	ki—âwâwag	-ĕw	-ewag
	Men.	ni—âwag	ni—andâwag	ki—andâwag	ki—âwag	ki—âwâwag	-âwa	-âwag
	F.	ne—âwagi	ne—âpena	ke—âpena	ke—âwagi	ke—âpwa	-âwa	-âwagi
	S	ni—âgi	ni—âpe	ki—âpe	ki—âgi	ki—âwagi	ô—ahi	ô—âwahi
	Pass.	n—ak		k—awuk	k—ak	k—awa	u—al	u—awa
	Ab.	(n)—ank'			k—ank'	k—amba'	o—a'	
	Oj	nin—ag	nin—ananig	ki—ananig	ki—ag	ki—âwag	o—an	o—âwan
	A.	ni—ak	ni—ananik	ki—ananik	ki—ak	ki—âwuk	o—â	o—awâ
	P.	ni—aki[1]						
	N.	n—oug	n—unanog		k—oog	k—oog	-uh	-auh
	D.	n'— awak / anewa	n'— awuna / awunanak / awawuna / awawak		k'— awak / anewa	k'— awawak / awawali	ô-awak / u'—awak	-awawak / w'—awawak / -awawali / -gak / w'—anawak
it	C (L.)	ni—en	ni—enân	ki— enow / enanaw	ki—en	ki—endâwaw	-am	-amwuk
	C (F. T.)	ni—ân	ni—ânân	ki—ânân	ki—ân	ki—ândâwâwa	-am	-amwag
	Men	ni—an	ni—âmindâwa	ki—a[s]	ki—an	ki—amiwâwa	-am	-amug
	F	ne—a	ne—âpena	ke—âpena	ke—a	ke—âpua	-amwa	-amâgi
	S.	ni—a	ni—âpe	ki—âpe	ki—a	ki—andâwa	ô—a	o—ândâwa
	Pass.							
	Ab.							
	Oj	nin—ân	nin—âmin	ki—âmin	ki—an	ki—ânawa	-âm	o—ânawa
	A.	ni—an	ni—ananan	ki—anan	ki—an	ki—anawa	o—an	o—anawa
	P.						amwa	-amôki
	N	n—umun	n—umumun		k—umun	k—umumiwoo	-umun / -um	-umwog
	D.	n'—amen	n'—amokkena		[k?]—amen	[k'?]—amokkumo	-amen	-amenewa
them inan	C (L.)[1]	ni—en	ni—enân	ki— enow / enanaw	ki—en	ki—endâwaw	-am	-amwuk
	C. (F. T.)	ni—ân	ni—ânân	ki—ânân	ki—ân	ki—ândâwâwa	-am	-amwag
	Men.	ni—an	ni—âmindâwa	ki—a[s]	ki—an	ki—amiwâwa	-am	-amug
	F.	ne—a	ne—âpena	ke—âpena	ke—a	ke—âpua	-amwa	-amôgi
	S.	ni—âna	ni—âpe	ki—âpe	ki—âna	ki—endâwa	ô—âna	o—andâwa
	Pass.							
	Ab.							
	Oj.	nin—ânan	nin—âmin	ki—âmin	ki—ânan	ki—ânawan	o—ânan	o—ânawan
	A.	ni—anan	ni—anananin	ki—anananin	ki—anan	ki—anawan	o—anan	o—anawan
	P.						-amwa	-amôki
	N	n—umun	n—umumun		k—umun	k—umumuwoo	-umun / -um	-umwog
	D.	n'—amen	n'—amokkena		[k?]—amen	[k'?]—amokkumo	-amen	-amenewa

you	C.	-tlakwuk	-tlak	—	—	—	-tlak	-tlakwuk / -tlakwow
	F	-nagwe	-nâge	—	—	—	-nâgwe	-nâgwe
	S.	-lagô	-lâge	—	—	—	-luâgwe	-luâgwe
	Oj.	-nagog	-gowg	—	—	—	-neg	-negwa
	A.	-naguk	-nang	—	—	—	-nag	-nagwa
	P.			—	—			
	N	-nog	-nog	—	—	—	-kqueôg	-kqueôg
	D.	-lrgue	-lrgue		—	—	-queque	-queque
him	C.	-uk	-ukit	-uk	-ut	-âk	-at	-atcik / -atwaw
	F.	-age	-agete	-agwe	-ate	-âgwe	-âte	-âwâte
	S	-age	-agite	-agwe	-ate	-âgwe	-âte	-âwâte
	Oj.	-ag	-angid	-ang	-ad	-eg	-âd	-awad
	A	-ak	-angite	-ang	-ate	-eg	-âte	-awate
	P.	-akâ		-anguâ	-atâ	-akuâ	-atô	-awatâ
	N.	-og	-ogkut		-adt	-o'g	-ont	
	D	-ackte / ake		-angue	-anue	-ague	ate	-achtite
them an.	C.	-ukik	ukitcik	-ukik	-utcik	-akwu'k	-at	-atcik / -atwow
	F	-age	-agete	-agwe	-ate	-âgwe	-ate	-awâte
	S	-age	-agite	-agwe	-ate	-âgue	-âte	-âwâte
	Oj	-agwa	-angidwa	-angwa	-adwa	-egwa	-âd	-awad
	A.	-akwa	-angitwa	-angwa	-atwa	-egwa	-âte	-awate
	P.							
	N	-og	-ogkut		-adt	-o'g	-ont / -ahetit	-a'hetit
	D.	-achtite / -awake		-awunque	-awunue / -achte / -awawonnue	-awake / -achtique / (-eke?)	-achtite / akhitite	-achtite / -awachtite
it, them inan	C.	-amân	-amâk	-amak	-aman	-amek	-ak	-akwaw / -akik
	F.	-amâue	-amâge	-amagwe	-amane	-amâgwe	-age	-amowâte
	S.	-ama	-amâge	-amagwe	-amane	-amâgwe	-age	-amuwâte
	Oj.	-âmân	-âmâng	-âmâng	-âman	-âmeg	-âng	-âmowad
	A.	-amân	-amâng	-amang	-aman	-ameg	-ang	-amowate
	P.					-amakwa		
	N.	-uman	-umog		-uman	-umog	-uk	-umahetit
	D.	-ama	-amenke / -amengue		-amane	-ameque	-ake	-amichtite

you	F.	-nagowe	-nâge	—	—	—	-nâgwe	-nâgwe
	S.	-lago	-lâge	—	—	—	-luâgwe	-luâgwe
	M.	-lux	-lek	—	—	—	-lox	-lox
	P.	-lukoki	-lungi		—	—	-lâkwa	-lâkwiki
him	F.	-agi	-agetei	-agwe	-atci	-âgwe	-âtci	-âwâtei
	S.	-agi	-agitei	-agwe	-atci	-âgwe	-âtci	-âwâtci
	M.	-uk	-ugei			-ox	-adi	-adidi
	P.	-aki	-akinci	-angwi	-adji	-ekwi	-ata	-atciki
them an.	F	-agi	-agitci	-agwe	-atc	-âgwe	-âtci	-âwâtci
	S.	-agi	-agitci	-agwe	-at	-âgwe	-âtci	-âwâtci
	M.	-gik	-ugidjik			-ox	-adji	-adidjik
	P.	-akiki	-akinciki	-angwi	[illegible]	-ekwi-ki?	-atciki	[illegible]
it, them inan.	F	-amâni	-amâge	-amagwe	-amani	-amâgwe	-agi	-amowâtci
	S.	-amâ	-amâge	-amagwe	-amani	-amâgwe	-agi	-amuwâtci
	M.							
	P.	-amoni	-amangi				-angi	-amowatci

[1] See the footnotes to the table on p. 263

[2] See p. 239.

LEGEND

EASTERN-CENTRAL ALGONQUIAN GROUP

LANGUAGES OF THE CREE TYPE

Cree and Montagnais
Nascapee
Menominee
Sauk Fox, and Kickapoo
Shawnee
Abnaki - Micmac Group { Abnaki, Pennacook, Micmac }

LANGUAGES OF THE CHIPPEWA TYPE

Chippewa, Ottawa, Potawatomi and Algonkin
Illinois and Miami

LANGUAGES OF THE MASSACHUSET TYPE

Massachuset, Narraganset, Wampanoag
Nauset, Montauk ect
(Nipmuk and Connecticut River Indians)

LANGUAGES THE EXACT POSITION OF WHICH IS UNCERTAIN

Unami, Unalachtigo, Munsee, Wappinger
Mahican and Pequot.

SIKSIKA

CHEYENNE AND SUTAIO

ARAPAHO AND ATSINA

UNCERTAIN

NANTICOKE, CONOY, POWHATAN WEAPEMEOC SECOTAN ETC.

NOTE—
Names in parenthesis belong to tribes, each of which probably forms one group with that beneath which it is placed, but they are kept apart for the present for lack of sufficient data.

MAP SHOWING THE DISTRIBUTION AND INTERRELATION OF THE ALGONQUIAN DIALECTS

BY

J. R. SWANTON AND TRUMAN MICHELSON

1911

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LIST OF PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY

With Index to Authors and Titles

NOTE

The publications of the Bureau of American Ethnology consist of Contributions to North American Ethnology, Annual Reports, Bulletins, Introductions, and Miscellaneous Publications.

The series of Contributions, in quarto, was begun in 1877 by the Geographical and Geological Survey of the Rocky Mountain Region (J. W. Powell, director). Of the earlier numbers, printed under authority of special resolutions of Congress, volumes I, II (in two parts), and III had been completed when, in the year 1879, the Bureau of Ethnology was organized, with J. W. Powell as director. In March, 1881, the publication of volumes VI, VII, VIII, IX, and X was authorized by concurrent resolution of Congress, but the series was discontinued in 1895, after volumes I to VII and IX had been completed.

The publication of the Annual Reports in royal octavo form began with that for the fiscal year ending June 30, 1880. Until 1895 the successive reports were each authorized by Congress, usually by concurrent resolution; since that time they have been published under authority of the law providing for the printing and binding and the distribution of public documents, approved January 12, 1895.

At the close of the fiscal year 1911–12, twenty-seven Annual Reports had appeared (the Fourteenth, Seventeenth, Eighteenth, Nineteenth, and Twenty-second, each in two parts), in all, thirty-two volumes. The Twenty-eighth Report has since been published.

The present maximum edition of the Annual Reports is 9,850 copies. Of these the Senate receives 1,500, the House of Representatives 3,000, and the Bureau of American Ethnology 3,500 copies. From the remaining 1,850 copies are drawn the personal copies of Senators, Representatives, and Delegates, and 500 copies for distribution to Government libraries and to designated public depositories[1] throughout the country. The remainder are sold by the Superintendent of Documents, Government Printing Office, at a slight advance on the cost.

[1] Each Senator, Representative, and Delegate in Congress is entitled to designate one depository to receive all public documents (see annual reports of the Superintendent of Documents, Government Printing Office).

In August, 1886, the director of the bureau was authorized by joint resolution of Congress to begin the publication of a series of bulletins, which were issued in octavo form and in paper covers; and in July, 1888, the continuation of the series was authorized by concurrent resolution. Provision for publishing the bulletins was omitted from the public printing law of January 12, 1895, and the issue terminated in 1894. Up to that time 24 bulletins had been published. By concurrent resolution in April, 1900, Congress authorized the resumption of the Bulletin series in royal octavo form. Nos. 25, 26, and 27 were issued under this provision, and in February, 1903, by joint resolution of Congress the octavo form was again resumed. Since then bulletins 28, 29, 30 (in two parts),[1] 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 (part 1), 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, and 52 have appeared, while Nos. 40 (part 2) and 46 are in press. The maximum edition of the Bulletin series is 9,850 copies, of which the Senate receives 1,500, the House of Representatives 3,000, and the Bureau of American Ethnology 3,500 copies. The remaining 1,850 copies are distributed by the Superintendent of Documents, Government Printing Office. Of these about 500 copies are sent to designated libraries; the rest are held by him for sale at a price slightly above cost.

Besides the series mentioned there have been issued small editions of four Introductions and of eight Miscellaneous Publications, intended wholly or chiefly for the use of collaborators and correspondents. These were not specially authorized by Congress, but as a rule were paid for from the annual appropriations for continuing researches.

With the exception of the few copies of the publications of the bureau disposed of by the Superintendent of Documents the editions are distributed free of charge. The quota allowed the bureau is distributed mainly to libraries and institutions of learning and to collaborators and others engaged in anthropological research or in instruction.

Annual Reports

First annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1879–80 by J. W. Powell director [Vignette] Washington Government Printing Office 1881

Roy. 8°. xxxv, 603 p., 347 fig. (incl. 54 pl.), map. *Out of print.*

Report of the Director. P. xi–xxxiii.

On the evolution of language, as exhibited in the specialization of the grammatic processes, the differentiation of the parts of speech, and the integration of the sentence; from a study of Indian languages, by J. W. Powell. P. 1–16.

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[1] By concurrent resolution of Congress in August, 1912, a reprint of Bulletin 30 was ordered in an edition of 6,500 copies, of which 4,000 were for the use of the House of Representatives, 2,000 for the use of the Senate, and 500 for the use of the Bureau of American Ethnology.

Sketch of the mythology of the North American Indians, by J. W. Powell. P. 17–56.

Wyandot government: a short study of tribal society, by J. W. Powell. P. 57–69.

On limitations to the use of some anthropologic data, by J. W. Powell. P. 71–86.

A further contribution to the study of the mortuary customs of the North American Indians, by Dr. H. C. Yarrow, act. asst. surg., U. S. Army. P. 87–203, fig. 1–47.

Studies in Central American picture-writing, by Edward S. Holden, professor of mathematics, U. S. Naval Observatory. P. 205–245, fig. 48–60.

Cessions of land by Indian tribes to the United States: illustrated by those in the state of Indiana, by C. C. Royce. P. 247–262, map.

Sign language among North American Indians compared with that among other peoples and deaf mutes, by Garrick Mallery. P. 263–552, fig. 61–342*a*, 342*b*–346.

Catalogue of linguistic manuscripts in the library of the Bureau of Ethnology, by James C. Pilling. P. 553–577.

Illustration of the method of recording Indian languages. From the manuscripts of Messrs. J. O. Dorsey, A. S. Gatschet, and S. R. Riggs. P. 579–589.

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Second annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1880–81 by J. W. Powell director [Vignette] Washington Government Printing Office 1883 [1884] Roy. 8°. XXXVII, 477 p., 77 pl., fig. 1–35, 347–714 (382 of these forming 98 pl.), 2 maps. *Out of print.*

Report of the Director. P. XV–XXXVII.

Zuñi fetiches, by Frank Hamilton Cushing. P. 3–45, pl. I–XI, fig. 1–3.

Myths of the Iroquois, by Erminnie A. Smith. P. 47–116, pl. XII–XV.

Animal carvings from mounds of the Mississippi valley, by Henry W. Henshaw. P. 117–166, fig. 4–35.

Navajo silversmiths, by Dr. Washington Matthews, U. S. Army. P. 167–178, pl. XVI–XX.

Art in shell of the ancient Americans, by William H. Holmes. P. 179–305, pl. XXI–LXXVII.

Illustrated catalogue of the collections obtained from the Indians of New Mexico and Arizona in 1879, by James Stevenson. P. 307–422, fig. 347–697, map.

Illustrated catalogue of the collections obtained from the Indians of New Mexico in 1880, by James Stevenson. P. 423–465, fig. 698–714, map.

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Third annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution. 1881–82 by J. W. Powell director [Vignette] Washington Government Printing Office 1884 [1885] Roy. 8°. LXXIV, 606 p., 44 pl., 200 (+ 2 unnumbered) fig. *Out of print.*

Report of the Director. P. XIII–LXXIV.

On activital similarities. P. LXV–LXXIV.

Notes on certain Maya and Mexican manuscripts, by Prof. Cyrus Thomas. P. 3–65, pl. I–IV, fig. 1–10.

On masks, labrets, and certain aboriginal customs, with an inquiry into the bearing of their geographical distribution, by William Healey Dall, assistant U. S. Coast Survey; honorary curator U. S. National Museum. P. 67–202, pl. v–xxix.

Omaha sociology, by Rev. J. Owen Dorsey. P. 205–370, pl. xxx–xxxiii, fig. 12–42.

Navajo weavers, by Dr. Washington Matthews, U. S. A. P. 371–391, pl. xxxiv–xxxviii, fig. 42–59.

Prehistoric textile fabrics of the United States, derived from impressions on pottery, by William H. Holmes. P. 393–425, pl. xxxix, fig. 60–115.

Illustrated catalogue of a portion of the collections made by the Bureau of Ethnology during the field season of 1881, by William H. Holmes. P. 427–510, fig. 116–200.

Illustrated catalogue of the collections obtained from the pueblos of Zuñi, New Mexico, and Wolpi, Arizona, in 1881, by James Stevenson. P. 511–594, pl. xl–xliv.

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Fourth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1882–83 by J. W. Powell director [Vignette] Washington Government Printing Office 1886 [1887] Roy. 8°. lxiii, 532 p., 83 pl., 565 fig. *Out of print.*

Report of the Director. P. xxvii–lxiii.

Pictographs of the North American Indians. A preliminary paper, by Garrick Mallery. P. 3–256, pl. i–lxxxiii, fig. 1–111, 111*a*–209.

Pottery of the ancient Pueblos, by William H. Holmes. P. 257–360, fig. 210–360.

Ancient pottery of the Mississippi valley, by William H. Holmes. P. 361–436, fig. 361–463.

Origin and development of form and ornament in ceramic art, by William H. Holmes. P. 437–465, fig. 464–489.

A study of Pueblo pottery as illustrative of Zuñi culture growth, by Frank Hamilton Cushing. P. 467–521, fig. 490–564.

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Fifth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1883–84 by J. W. Powell director [Vignette] Washington Government Printing Office 1887 [1888] Roy. 8°. liii, 564 p., 23 pl. (incl. 2 pocket maps), 77 fig. *Out of print.*

Report of the Director. P. xvii–liii.

Burial mounds of the northern sections of the United States, by Prof. Cyrus Thomas. P. 3–119, pl. i–vi, fig. 1–49.

The Cherokee Nation of Indians: a narrative of their official relations with the colonial and federal governments, by Charles C. Royce. P. 121–378, pl. viii–ix (pl. vii and ix are pocket maps).

The mountain chant: a Navajo ceremony, by Dr. Washington Matthews, U. S. Army. P. 379–467, pl. x–xviii, fig. 50–59.

The Seminole Indians of Florida, by Clay MacCauley. P. 469–531, pl. xix, fig. 60–77.

The religious life of the Zuñi child, by Mrs. Tilly E. Stevenson. P. 533–555, pl. xx–xxiii.

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Sixth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1884–85 by J. W. Powell director [Vignette] Washington Government Printing Office 1888 [1889] Roy. 8°. LVIII, 675 p. (incl. 6 p. of music), 10 pl. (incl. 2 pocket maps), 546 fig., 44 small unnumbered cuts. *Out of print.*

Report of the Director. P. XXIII–LVIII.

Ancient art of the province of Chiriqui, Colombia, by William H. Holmes. P. 3–187, pl. I, fig. 1–285.

A study of the textile art in its relation to the development of form and ornament, by William H. Holmes. P. 189–252, fig. 286–358.

Aids to the study of the Maya codices, by Prof. Cyrus Thomas. P. 253–371, fig. 359–388.

Osage traditions, by Rev. J. Owen Dorsey. P. 373–397, fig. 389.

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Seventh annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1885–86 by J. W. Powell director [Vignette] Washington Government Printing Office 1891 [1892] Roy. 8°. XLIII, 409 p., 27 pl. (incl. pocket map), 39 fig. *Out of print.*

Report of the Director. P. XV–XLI.

Indian linguistic families of America north of Mexico, by J. W. Powell. P. 1–142, pl. I (pocket map).

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The sacred formulas of the Cherokees, by James Mooney. P. 301–397, pl. XXIV–XXVII.

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Eighth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1886–87 by J. W. Powell director [Vignette] Washington Government Printing Office 1891 [1893] Roy. 8°. XXXVI, 298 p., 123 pl., 118 fig. *Out of print.*

Report of the Director. P. XIII–XXXVI.

A study of Pueblo architecture: Tusayan and Cibola, by Victor Mindeleff. P. 3–228, pl. I–CXI, fig. 1–114.

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Ninth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1887–88 by J. W. Powell director [Vignette] Washington Government Printing Office 1892 [1893] Roy. 8°. XLVI, 617 p., 8 pl., 448 fig. *Out of print.*

Report of the Director. P. XIX–XLVI.

Ethnological results of the Point Barrow expedition, by John Murdoch, naturalist and observer, International Polar expedition to Point Barrow, Alaska, 1881–1883. P. 3–441, pl. I–II, fig. 1–428.

The medicine-men of the Apache, by John G. Bourke, captain, third cavalry, U. S. Army. P. 443–603, pl. III–VIII, fig. 429–448.

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Tenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1888–89 by J. W. Powell director [Vignette] Washington Government Printing Office 1893 [1894]
Roy. 8° xxx, 822 p., 54 pl., 1291 fig., 116 small unnumbered cuts. *Out of print.*

Report of the Director. P. III–XXX.
Picture-writing of the American Indians, by Garrick Mallery. P. 3–807, pl. I–LIV, fig. 1–145, 145*a*–1290.
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Eleventh annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1889–90 by J. W. Powell director [Vignette] Washington Government Printing Office 1894
Roy. 8°. XLVII, 553 p., 50 pl., 200 fig. *Out of print.*

Report of the Director. P. XXI–XLVII.
The Sia, by Matilda Coxe Stevenson. P. 3–157, pl. I–XXXV, fig. 1–20.
Ethnology of the Ungava district, Hudson Bay territory, by Lucien M. Turner. [Edited by John Murdoch.] P. 159–350, pl. XXXVI–XLIII, fig. 21–155.
A study of Siouan cults, by James Owen Dorsey. P. 351–544, pl. XLIV–L, fig. 156–200.
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Twelfth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1890–91 by J. W. Powell director [Vignette] Washington Government Printing Office 1894
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Report of the Director. P. XIX–XLVII.
Report on the mound explorations of the Bureau of Ethnology, by Cyrus Thomas. P. 3–730, pl. I–XLII, fig. 1–344.
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Thirteenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1891–92 by J. W. Powell director [Vignette] Washington Government Printing Office 1896
Roy. 8°. LIX, 462 p., 60 pl., 330 fig. *Out of print.*

Report of the Director. P. XIX–LIX.
Prehistoric textile art of Eastern United States, by William Henry Holmes. P. 3–46, pl. I–IX, fig. 1–28.
Stone art, by Gerard Fowke. P. 47–178, fig. 29–278.
Aboriginal remains in Verde valley, Arizona, by Cosmos Mindeleff. P. 179–261, pl. X–L, fig. 279–305.
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Outlines of Zuñi creation myths, by Frank Hamilton Cushing. P. 321–447.
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Fourteenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution 1892–93 by J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1896 [1897]

Roy. 8°. Two parts. LXI, 1–637; 639–1136 p., 122 pl., 104 fig. *Out of print.*

Report of the Director. P. XXV–LXI.

The Menomini Indians, by Walter James Hoffman, M. D. P. 3–328, pl. I–XXXVII, fig. 1–55.

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The Ghost-dance religion and the Sioux outbreak of 1890, by James Mooney. P. 641–1110, pl. LXXXV–CXXII, fig. 56–104.

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Fifteenth annual report of the Bureau of Ethnology to the secretary of the Smithsonian Institution. 1893–94 by J. W. Powell director [Vignette] Washington Government Printing Office 1897

Roy. 8°. CXXI, 366 p., frontispiece, 125 pl., 49 fig. *Out of print.*

Report of the Director. P. XV–CXXI.

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Stone implements of the Potomac-Chesapeake tidewater province, by William Henry Holmes. P. 3–152, pl. I–CIII and frontispiece, fig. 1–29a.

The Siouan Indians: a preliminary sketch, by W J McGee. P. 153–204.

Siouan sociology: a posthumous paper, by James Owen Dorsey. P. 205–244. fig. 30–38.

Tusayan katcinas. by Jesse Walter Fewkes. P. 245–313, pl. CIV–CXI, fig. 39–48.

The repair of Casa Grande ruin, Arizona, in 1891, by Cosmos Mindeleff. P. 315–349, pl. CXII–CXXV.

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Sixteenth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1894–95 by J. W. Powell director [Vignette] Washington Government Printing Office 1897

Roy. 8°. CXIX, 326 p., 81 pl., 83 fig. *Out of print.*

Report of the Director. P. XIII–CXIX.

List of publications of the Bureau of American Ethnology. P. CI–CXIX.

Primitive trephining in Peru, by Manuel Antonio Muñiz and W J McGee. P. 3–72, pl. I–XL.

The cliff-ruins of Canyon de Chelly, Arizona. by Cosmos Mindeleff. P. 73–198, pl. LXI–LXIII, fig. 1–83.

Day symbols of the Maya year, by Cyrus Thomas. P. 199–265, pl. LXIV–LXIX.

Tusayan snake ceremonies, by Jesse Walter Fewkes. P. 267–312, pl. LXX–LXXXI.

Index. P. 313–326.

Seventeenth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1895–96 by J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1898 [part 1, 1900, part 2, 1901]

Roy. 8°. Two parts, XCV, 1–128, 129*–344*, 129–468; 465–752 p., 182 pl., 357 fig. *Out of print.*

Report of the Director. P. XXV–XCIII.
List of publications of the Bureau of American Ethnology. P. LXXV–XCIII.
The Seri Indians, by W J McGee. P. 1–128, 129*–344*, pl. I–IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb–IXa, IXb–LVI, fig. 1–42.
Comparative lexicology, by J. N. B. Hewitt. P. 299*–344*.
Calendar history of the Kiowa Indians, by James Mooney. P. 129–445, pl. LVII–LXXXI, fig. 43–229.
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Navaho houses, by Cosmos Mindeleff. P. 469–517, pl. LXXXII–XC, fig. 230–244.
Archeological expedition to Arizona in 1895, by Jesse Walter Fewkes. P. 519–744, pl. XCIa, XCIb–CLXXV, fig. 245–357.
Index to part 2. P. 745–752.

Eighteenth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1896–97 by J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1899 [part 1, 1901, part 2, 1902]

Roy. 8°. Two parts, LVII, 1–518; 519–997 p., 174 pl., 165 fig. *Out of print.*

Report of the Director. P. XXIII–LVII.
The Eskimo about Bering strait, by Edward William Nelson. P. 3–518, pl. I–CVII, fig. 1–165.
Indian land cessions in the United States, compiled by Charles C. Royce, with an introduction by Cyrus Thomas. P. 521–964, pl. CVIII–CLXXIV.
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Nineteenth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1897–98 by J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1900 [1902]

Roy. 8°. Two parts, XCII, 1–568, 569*–576*; 569–1160 p., frontispiece, 80 pl., 49 fig. *Out of print.*

Report of the Director. P. IX–XCII, frontispiece.
Esthetology, or the science of activities designed to give pleasure. P. LV–XCII.
Myths of the Cherokee, by James Mooney. P. 3–548, pl. I–XX, fig. 1–2.
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Tusayan migration traditions, by Jesse Walter Fewkes. P. 573–633.
Localization of Tusayan clans, by Cosmos Mindeleff. P. 635–653, pl. XXI–XXVIII, fig. 3.
Mounds in northern Honduras, by Thomas Gann. P. 655–692, pl. XXIX–XXXIX, fig. 4–7.
Mayan calendar systems, by Cyrus Thomas. P. 693–819, pl. XL–XLIIIa, XLIIIb–XLIV, fig. 8–17a, 17b–22.
Primitive numbers, by W J McGee. P. 821–851.
Numeral systems of Mexico and Central America, by Cyrus Thomas. P. 853, 955, fig. 23–41.

Tusayan Flute and Snake ceremonies, by Jesse Walter Fewkes. P. 957–1011, pl. XLV–LXV, fig. 42–46.

The wild-rice gatherers of the upper lakes, a study in American primitive economics, by Albert Ernest Jenks. P. 1013–1137, pl. LXVI–LXXIX, fig. 47–48.

Index to part 2. P. 1139–1160.

Twentieth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1898–99 by J. W. Powell director [Vignette] Washington Government Printing Office 1903

Roy. 8°. CCXXIV, 237 p., 180 pl., 79 fig. *Out of print.*

Report of the Director. P. VII–CCXXIII.

Technology, or the science of industries. P. XXIX–LVII.

Sociology, or the science of institutions. P. LIX–CXXXVIII.

Philology, or the science of activities designed for expression. P. CXXXIX–CLXX.

Sophiology, or the science of activities designed to give instruction. P. CLXXI–CXCVII.

List of publications of the Bureau of American Ethnology. P. CXCIX–CCXXIII.

Aboriginal pottery of the eastern United States, by W. H. Holmes. P. 1–201, pl. I–LXXVIII, LXXVIII A, LXXIX–LXXIX B, LXXX–CLXXVII, fig. 1–79.

Index.

Twenty-first annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1899–1900 by J. W. Powell director [Vignette] Washington Government Printing Office 1903

Roy. 8°. XL, 360 p., 69 pl. *Out of print.*

Report of the Director. P. VII–XL, pl. I.

Hopi katcinas, drawn by native artists, by Jesse Walter Fewkes. P. 3–126, pl. II–LXIII.

Iroquoian cosmology, by J. N. B. Hewitt. P. 127–339, pl. LXIV–LXIX.

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Twenty-second annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1900–1901 J. W. Powell director In two parts—part 1 [–2] [Vignette] Washington Government Printing Office 1903

Roy. 8°. Two parts. XLIV, 1–320; 1–372 p., 91 pl., 178 fig. *Out of print.*

Report of the Acting Director. P. VII–XLIV.

Two summers' work in pueblo ruins, by Jesse Walter Fewkes. P. 3–195, pl. I–LXX, fig. 1–120.

Mayan calendar systems. II, by Cyrus Thomas. P. 197–305, pl. LXXI–LXXXII, fig. 121–168.

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The Hako, a Pawnee ceremony, by Alice C. Fletcher, holder of Thaw fellowship, Peabody Museum, Harvard University. P. 5–368, pl. LXXXIII–XCI, fig. 169–178.

Index to part 2.

Twenty-third annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1901–2 J. W. Powell director [Vignette] Washington Government Printing Office 1904 [1905]

Roy. 8°. XLV, 634 p., 139 pl., 34 fig. *Out of print.*

Report of the Acting Director. P. VII–XLV.
The Zuñi Indians, their mythology, esoteric fraternities, and ceremonies, by Matilda Coxe Stevenson. P. 1–608.
Index.

Twenty-fourth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1902–3 W. H. Holmes chief [Vignette] Washington Government Printing Office 1907

Roy. 8°. XL, 846 p., 21 pl., 1112 fig. *Out of print.*

Report of the Chief. P. VII–XL.
Games of the North American Indians, by Stewart Culin. P. 3–809.
Index.

Twenty-fifth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1903–4 [Vignette] Washington Government Printing Office 1907

Roy. 8°. XXIX, 296 p., 129 pl., 70 fig. *Out of print.*

Report of the Chief. P. IX–XXIX.
The aborigines of Porto Rico and neighboring islands, by Jesse Walter Fewkes. P. 3–220, pl. I–XCIII, fig. 1–43.
Certain antiquities of eastern Mexico, by Jesse Walter Fewkes. P. 221–284, pl. XCIV–CXXIX, fig. 44–70.
Index.

Twenty-sixth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1904–5 [Vignette] Washington Government Printing Office 1908

Roy. 8°. XXXI, 512 p., 58 pl., 117 fig. *Out of print.*

Report of the Chief. P. VII–XXXI.
The Pima Indians, by Frank Russell. P. 3–389, pl. I–XLVII, fig. 1–102.
The Tlingit Indians, by John R. Swanton. P. 391–485, pl. XLVIII–LVIII, fig. 103–117.
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Twenty-seventh annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1905–6 [Vignette] Washington Government Printing Office 1911

Roy. 8°. P. 672, 65 pl., 132 fig.

Report of the Chief. P. 5–14.
The Omaha Tribe, by Alice C. Fletcher, holder of the Thaw fellowship, Peabody Museum, Harvard University, and Francis La Flesche, a member of the Omaha tribe. P. 15–654.
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Twenty-eighth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1906–7 [Vignette] Washington Government Printing Office 1912

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Casa Grande, Arizóna, by Jesse Walter Fewkes. P. 25–179, pl. 1–78, fig. 1–54.

Antiquities of the upper Verde River and Walnut Creek valleys, Arizona, by Jesse Walter Fewkes. P. 181–220, pl. 79–102, fig. 55–68.

Preliminary report on the linguistic classification of Algonquian tribes, by Truman Michelson. P. 221–290, pl. 103.

List of publications of the Bureau of American Ethnology. P. I–XXXV.

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Twenty-ninth annual report of the Bureau of American Ethnology to the secretary of the Smithsonian Institution 1907–8 [Vignette] Washington Government Printing Office

Roy. 8°.

Report of the Chief.

BULLETINS

(1). Bibliography of the Eskimo language by James Constantine Pilling 1887

8°. v, 116 p. (incl. 8 p. of facsimiles).

(2). Perforated stones from California by Henry W. Henshaw 1887

8°. 34 p., 16 fig.

(3). The use of gold and other metals among the ancient inhabitants of Chiriqui, Isthmus of Darien by William H. Holmes 1887

8°. 27 p., 22 fig.

(4). Work in mound exploration of the Bureau of Ethnology by Cyrus Thomas 1887

8°. 15 p., 1 fig.

(5). Bibliography of the Siouan languages by James Constantine Pilling 1887

8°. v, 87 p.

(6). Bibliography of the Iroquoian languages by James C. Pilling 1888 [1889]

8°. VI, 208 p. (incl. 4 p. facsimiles), 5 unnumbered facsimiles. *Out of print.*

(7). Textile fabrics of ancient Peru by William H. Holmes 1889

8°. 17 p., 11 fig.

(8). The problem of the Ohio mounds by Cyrus Thomas 1889

8°. 54 p., 8 fig.

(9). Bibliography of the Muskhogean languages by James Constantine Pilling 1889

8°. v, 114 p. *Out of print.*

(10). The circular, square, and octagonal earthworks of Ohio by Cyrus Thomas 1889

8°. 35 p., 11 pl., 5 fig. *Out of print.*

(11). Omaha and Ponka letters by James Owen Dorsey 1891

8°. 127 p. *Out of print.*

(12). Catalogue of prehistoric works east of the Rocky mountains by Cyrus Thomas 1891

8°. 246 p., 17 pl. and maps. *Out of print.*

(13). Bibliography of the Algonquian languages by James Constantine Pilling 1891 [1892]

8°. x, 614 p., 82 facsimiles. *Out of print.*

(14). Bibliography of the Athapascan languages by James Constantine Pilling 1892

8°. xiii, 125 p. (incl. 4 p. facsimiles). *Out of print.*

(15). Bibliography of the Chinookan languages (including the Chinook jargon) by James Constantine Pilling 1893

8°. xiii, 81 p. (incl. 3 p. facsimiles). *Out of print.*

(16). Bibliography of the Salishan languages by James Constantine Pilling 1883

8°. xiii, 86 p. (incl. 4 p. facsimiles). *Out of print.*

(17). The Pamunkey Indians of Virginia by Jno. Garland Pollard 1894

8°. 19 p. *Out of print.*

(18). The Maya year by Cyrus Thomas 1894

8°. 64 p., 1 pl. *Out of print.*

(19). Bibliography of the Wakashan languages by James Constantine Pilling. 1894

8°. xi, 70 p. (Incl. 2 p. facsimiles).

(20). Chinook texts by Franz Boas 1894 [1895]

8°. 278 p., 1 pl. *Out of print.*

(21). An ancient quarry in Indian Territory by William Henry Holmes 1894

8°. 19 p., 12 pl., 7 fig. *Out of print.*

(22). The Siouan tribes of the East by James Mooney 1894 [1895]

8°. 101 p., map. *Out of print.*

(23). Archeologic investigations in James and Potomac valleys by Gerard Fowke 1894 [1895]

8°. 80 p., 17 fig. *Out of print.*

(24). List of the publications of the Bureau of Ethnology, with index to authors and subjects by Frederick Webb Hodge 1894

8°. 25 p. *Out of print.*

(25). Natick dictionary by James Hammond Trumbull 1903
Roy. 8°. xxviii, 349 p.

(26). Kathlamet texts by Franz Boas 1901
Roy. 8°. 261 p., 1 pl.

(27). Tsimshian texts by Franz Boas 1902
Roy. 8°. 244 p.

(28). Mexican and Central American antiquities, calendar systems, and history twenty-four papers by Eduard Seler, E. Förstemann, Paul Schellhas, Carl Sapper, and E. P. Dieseldorff translated from the German under the supervision of Charles P. Bowditch 1904
8°. 682 p., 49 pl., 134 fig.

(29). Haida texts and myths by John R. Swanton 1905
Roy. 8°. 448 p., 5 fig.

(30). Handbook of American Indians north of Mexico edited by Frederick Webb Hodge Pt. 1 1907 Pt. 2 1910
8°. Pt. 1. ix, 972 p., many figures, map. Pt. 2 iv, 1221 p., many figures. *Out of print.*
Reprint, 1912.

(31). List of publications of the Bureau of American Ethnology, with index to authors and titles 1906
8°. 31 p. *Out of print.*

(32). Antiquities of the Jemez plateau, New Mexico by Edgar L. Hewett 1906
8°. 55 p., 17 pl., 31 fig., map

(33). Skeletal remains suggesting or attributed to early man in North America by Aleš Hrdlička 1907
8°. 113 p., 21 pl., 16 fig.

(34). Physiological and medical observations among the Indians of southwestern United States and northern Mexico by Aleš Hrdlička 1908
8°. ix, 460 p., 28 pl., 2 fig.

(35). Antiquities of the upper Gila and Salt River valleys in Arizona and New Mexico by Walter Hough 1907
8°. 96 p., 11 pl., 51 fig., map

(36). List of the publications of the Bureau of American Ethnology, with index to authors and titles 1907
8°. 31 p. *Out of print.*

(37). Antiquities of central and southeastern Missouri by Gerard Fowke. (Report on explorations made in 1906–7 under the auspices of the Archæological Institute of America) 1910
8°. vii, 116 p., 19 pl., 20 fig.

(38). Unwritten literature of Hawaii The sacred songs of the hula compiled and translated, with notes and an account of the hula by Nathaniel B. Emerson, A. M., M. D. 1909
8°. 288 p., 24 pl., 3 fig., 14 musical pieces

(39). Tlingit myths and texts by John R. Swanton 1909
8°. VIII, 451 p.

(40). Handbook of American Indian languages by Franz Boas Part 1 With illustrative sketches by Roland B. Dixon [Maidu], P. E. Goddard [Athapascan: Hupa], William Jones, revised by Truman Michelson [Algonquian (Fox)], John R. Swanton [Tlingit, Haida], William Thalbitzer [Eskimo]; [Franz Boas: Introduction, Chinook, Kwakiutl, Tsimshian; John R. Swanton and Franz Boas, Siouan] 1911. [Each sketch was issued also in separate form.]
8°. VII, 1069 p.

(41). Antiquities of the Mesa Verde National Park: Spruce-tree House by J. Walter Fewkes 1909
8°. VIII, 57 p., 21 pl., 37 fig.

(42). Tuberculosis among certain Indian tribes of the United States by Aleš Hrdlička 1909
8°. VII, 48 p., 22 pl.

(43). Indian tribes of the lower Mississippi valley and adjacent coast of the Gulf of Mexico by John R. Swanton 1911
8°. VII, 387 p., 32 pl. (including 1 map), 2 fig.

(44). Indian languages of Mexico and Central America, and their geographical distribution by Cyrus Thomas, assisted by John R. Swanton Accompanied with a linguistic map 1911
8°. VII, 108 p., 1 map

(45). Chippewa music by Frances Densmore 1910
8°. XIX, 216 p., 12 pl., 8 fig., many musical pieces

(47). A dictionary of the Biloxi and Ofo languages, accompanied with thirty-one Biloxi texts and numerous Biloxi phrases by James Owen Dorsey and John R. Swanton 1912
8°. V, 340 p.

(48). The Choctaw of Bayou Lacomb, St. Tammany parish, Louisiana by David I. Bushnell, Jr. 1909
8°. 37 p., 22 pl., 1 fig. *Out of print.*

(49). List of the publications of the Bureau of American Ethnology, with index to authors and titles 1910
8°. 32 p. *Out of print.* (Second impression 1911, 34 p. *Out of print.*)

(50). Preliminary report on a visit to the Navaho National Monument, Arizona by Jesse Walter Fewkes 1911
8°. VII, 35 p., 22 pl., 3 fig.

(51). Antiquities of the Mesa Verde National Park: Cliff Palace by Jesse Walter Fewkes 1911
8°. 82 p., 35 pl., 4 fig.

(52). Early man in South America by Aleš Hrdlička in collaboration with William H. Holmes, Bailey Willis, Fred. Eugene Wright, and Clarence N. Fenner 1912
8°. XV, 405 p., 68 pl., 51 fig.

In Press

(40). Handbook of American Indian languages by Franz Boas Part 2 With illustrative sketches

(46). Choctaw dictionary by Cyrus Byington edited by John R. Swanton

In Preparation

(53). Chippewa music—II by Frances Densmore

(54). The physiography of the Rio Grande valley, New Mexico, in relation to Pueblo culture: (1) Rio Grande valley, New Mexico, by Edgar Lee Hewett; (2) Geology and topography of the Rio Grande region in New Mexico, by Junius Henderson; (3) Climate and evidences of climatic changes, by Junius Henderson and Wilfred W. Robbins.

(55). The ethnobotany of the Tewa Indians by Wilfred W. Robbins and J. P. Harrington

(56). The ethnozoology of the Tewa Indians by Junius Henderson and J. P. Harrington

(57). The cosmography of the Tewa Indians by J. P. Harrington

(58). An introduction to the study of the Maya hieroglyphs by Sylvanus G. Morley

CONTRIBUTIONS TO NORTH AMERICAN ETHNOLOGY

(*All of the volumes of this series are out of print*)

Department of the Interior U. S. Geographical and Geological survey of the Rocky Mountain region J. W. Powell in charge—Contributions to North American ethnology—Volume I [–VII, IX]—[Seal of the department] Washington Government Printing Office 1877 [–1893]

4°. 9 vols.

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VOLUME I, 1877:

Part I. Tribes of the extreme Northwest, by W. H. Dall. P. 1–106, 10 unnumbered pl., 9 unnumbered fig., pocket map.

On the distribution and nomenclature of the native tribes of Alaska and the adjacent territory. P. 7–40, pocket map.

On succession in the shell-heaps of the Aleutian islands. P. 41–91, 10 pl., 9 fig.

On the origin of the Innuit. P. 93–106.

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Notes on the natives of Alaska (communicated to the late George Gibbs, M. D., in 1862), by His Excellency J. Furuhelm, late governor of the Russian-American colonies. P. 111–116.

Terms of relationship used by the Innuit: a series obtained from natives of Cumberland inlet, by W. H. Dall. P. 117–119.

VOLUME I, 1877—Continued.

Part I. Vocabularies [by George Gibbs and W. H. Dall]. P. 121–153.

Note on the use of numerals among the T'sim si-an', by George Gibbs, M. D. P. 155–156.

Part II. Tribes of western Washington and northwestern Oregon, by George Gibbs. M. D. P. 157–241, pocket map.

Appendix to part II. Linguistics. P. 243–361.

Vocabularies [by George Gibbs, Wm. F. Tolmie, and G. Mengarini]. P. 247–283.

Dictionary of the Niskwalli [Nisqualli-English and English-Nisqualli], by George Gibbs. P. 285–361.

VOLUME II, 1890 [1891]:

The Klamath Indians of southwestern Oregon, by Albert Samuel Gatschet. Two parts, cvii, 711 p., map; iii, 711 p.

VOLUME III, 1877:

Tribes of California, by Stephen Powers. 635 p., frontispiece, 44 fig. (incl. 42 pl.), 3 p. music, pocket map.

Appendix. Linguistics, edited by J. W. Powell. P. 439–613.

VOLUME IV, 1881:

Houses and house-life of the American aborigines, by Lewis H. Morgan. xiv, 281 p., frontispiece, 57 fig. (incl. 28 pl).

VOLUME V, 1882:

Observations on cup-shaped and other lapidarian sculptures in the Old World and in America, by Charles Rau. 1881. 112 p., 61 fig. (forming 35 pls.).

On prehistoric trephining and cranial amulets, by Robert Fletcher, M. R. C. S. Eng., act. asst. surgeon U. S. Army. 1882. 32 p., 9 pl., 2 fig.

A study of the manuscript Troano, by Cyrus Thomas, Ph. D., with an introduction by D. G. Brinton, M. D. 1882. xxxvii, 237 p., 9 pl., 101 fig., 25 small unnumbered cuts.

VOLUME VI, 1890 [1892]:

The Çegiha language, by James Owen Dorsey. xviii, 794 p.

VOLUME VII, 1890 [1892]:

A Dakota-English dictionary, by Stephen Return Riggs, edited by James Owen Dorsey. x, 665 p.

VOLUME VIII: *Not published.*

VOLUME IX, 1893 [1894]:

Dakota grammar, texts, and ethnography, by Stephen Return Riggs, edited by James Owen Dorsey. xxxii, 239 p.

INTRODUCTIONS

(All of the volumes of this series are out of print)

(1). Introduction to the study of Indian languages, with words, phrases, and sentences to be collected. By J. W. Powell. [Seal of the Department of the Interior.] Washington Government Printing Office 1877

4°. 104 p., 10 blank leaves.

Second edition as follows:

(2). Smithsonian Institution—Bureau of Ethnology J. W. Powell director—Introduction to the study of Indian languages with words,

phrases and sentences to be collected—by J. W. Powell—Second edition—with charts—Washington Government Printing Office 1880

4°. xi, 228 p., 10 blank leaves, 4 kinship charts in pocket. A 16° "Alphabet" of 2 leaves accompanies the work.

(3). Smithsonian Institution—Bureau of Ethnology—Introduction to the study of sign language among the North American Indians as illustrating the gesture speech of mankind—by Garrick Mallery, brevet lieut. col., U. S. Army—Washington Government Printing Office 1880

4°. iv, 72 p., 33 unnumbered figs.

(4). Smithsonian Institution—Bureau of Ethnology J. W. Powell, director—Introduction to the study of mortuary customs among the North American Indians—by Dr. H. C. Yarrow act. asst. surg. U. S. Army—Washington Government Printing Office 1880

4°. ix, 114 p.

Miscellaneous Publications

(All of the works in this series, except No. 9, are out of print)

(1). Smithsonian Institution—Bureau of Ethnology J. W. Powell, director—A collection of gesture-signs and signals of the North American Indians with some comparisons by Garrick Mallery brevet lieut. col. and formerly acting chief signal officer, U. S. Army—Distributed only to collaborators—Washington Government Printing Office 1880

4°. 329 p.

Note. 250 copies printed for use of collaborators only.

(2). Smithsonian Institution—Bureau of Ethnology J. W. Powell director—Proof-sheets of a bibliography of the languages of the North American Indians by James Constantine Pilling—(Distributed only to collaborators)—Washington Government Printing Office 1885

4°. xl, 1135 p., 29 pl. (facsimiles).

Note. Only 110 copies printed for the use of collaborators, 10 of them on one side of the sheet. It was the intention to have this Bibliography form Volume X of the Contributions to North American Ethnology, but the work assumed such proportions that it was subsequently deemed advisable to publish it as a part of the series of Bulletins, devoting a Bulletin to each linguistic stock.

(3). Linguistic families of the Indian tribes north of Mexico, with provisional list of the principal tribal names and synonyms. [1885]

16°. 55 p.

Note. A few copies printed for the use of the compilers of a Dictionary of American Indians [Handbook. See *Bulletin 30*]. It is without title-page, name, or date, but was compiled from a manuscript list of Indian tribes by James Mooney.

(4). [Map of] Linguistic stocks of American Indians north of Mexico by J. W. Powell. [1891]

NOTE. A limited edition of this map, which forms plate 1 of the Seventh Annual Report, was issued on heavy paper, 19 by 22 inches, for the use of students. This map was revised and published in the Report on Indians Taxed and Not Taxed in the United States at the Eleventh Census, 1890. (See No. 7.)

(5). Tribes of North America, with synonymy. Skittagetan family. [1890]
4°. 13 p.

NOTE. A few copies printed for the use of the compilers of the Handbook of American Indians. It was prepared by H. W. Henshaw, and contains two samples of style for the Handbook, the second beginning on page 7 with the head, "Dictionary of Indian tribal names." (See *Bulletin 30.*)

(6). Advance pages Smithsonian Institution Bureau of American Ethnology—Dictionary of American Indians north of Mexico . . . [Vignette] Washington 1903
8°. 33 p.

NOTE. Prepared by F. W. Hodge. Two hundred and fifty copies printed by the Smithsonian Institution for the use of the compilers of the Dictionary [Handbook. See *Bulletin 30*].

(7) [Map of] Linguistic stocks of American Indians north of Mexico by J. W. Powell. [1906]

NOTE. Printed on heavy paper in advance of the Handbook of American Indians (*Bulletin 30*), part 1, of which it forms an illustration.

(8). Bureau of American Ethnology with list of publications. Reprinted from *Handbook of American Indians*, Bulletin 30 (pt. 1), Bureau of American Ethnology. [1906]
8°. 5 p.

(9). Indian missions north of Mexico by James Mooney. Reprinted from *Handbook of American Indians*, Bulletin 30 (pt. 1), Bureau of American Ethnology. Washington 1907
8°. 39 p.

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A=Annual Report. B=Bulletin. C=Contributions to North American Ethnology. I=Introduction. M=Miscellaneous Publications.

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